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Contents

Dimensions of Perceived Risk and Their Influence on Consumers' Purchasing Behavior in the Overall Process of B2C

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Abstract. The influence of perceived risk on customers' purchasing behavior still plays an important role in the overall process of business to customer(B2C) E-commerce, though the extent to which it does so varies according to the characteristics of consumers. In this study, perceived risk dimensions affecting customers' purchasing behavior and their structural relationships were investigated through a customer survey and statistical analysis using the methods of confirmatory factor analysis and structural equation model. The result shows that the five independent dimensions, perceived health risk, perceived quality risk, perceived time risk, perceived delivery risk and perceived after-sale risk affect significantly customers' purchasing behavior, while perceived privacy risk, perceived social risk and perceived economic risk are the less relevant factors.

Keywords: risk dimensions, perceived risk, consumers' purchasing behavior, overall process of B2C.

1 Introduction

Consumers' perceived risk is considered to be one of the important factors that impact on consumers' purchasing behavior in their decision-making, and it is also one of the important research themes for consumer purchasing behavior analysis of shopping online in E-commerce [1, 2]. Many prior researches focused on the risks in the phase of online transactions, put forward the structure of risk dimensions in different perspectives such as the lack of security, privacy risk, the credibility of online retailers or reliability risk[3, 4], functional risk, shopping risk, time risk, social risk, psychological risk and so on[5, 6]. Among them, there were little studies about the structure of risk dimensions and their influence on consumer purchasing behavior for the overall process of B2C, especially based on empirical research.

The overall process of B2C includes information searching before buying, the choosing of products and the service after purchasing. Therefore, the consumer's perception of risk should not only in the phase of online transactions but also in every phases of the overall process, and so does the influence.

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Although different researchers have proposed different dimensions of perceived risk, there is a gap about the dimensions of perceived risk in the overall process of B2C and further what dimensions have significant influence on consumers' purchasing behavior. We addressed this gap in the literature by attempting to provide an empirical exploration of the dimensions of perceived risk, their impact on consumers' purchasing behavior, and the relationships between constructs in the overall process of B2C.

In this paper, based on risk perception theory[7, 8], we empirically tested what risk factors from the overall process of B2C may really cause consumers' perceived risks and examined what dimensions of perceived risks significantly influenced consumers' purchasing behavior in the overall process of B2C.

2 Literature Reviwe and Research Hypotheses

The original concept of perceived risk is proposed by R. A. Bauer[7]. Cox[8]gave the specific explanation of perceived risk. The dimensions of perceived risk are the specific contents or types of perceived risk. According to the theory of consumers' perceived risk, when consumers face uncertainty and potentially undesirable consequences as a result of purchase, they will perceive risk [9, 10].The more risk consumers perceive, the less likely it is that they will make a purchase. Therefore, Perceived risk is powerful at explaining consumers' behavior because "consumers are more often motivated to avoid mistakes than to maximize utility in purchasing" Mitchell [11].

Many previous researches have studied perceived risk dimensions from different perspectives. Mitchell [12] showed that consumer perceived different levels of risk at every stage in the purchasing process. Dahai Dong et al.[13] analyzed four dimensions of perceived risk through qualitative exploration. Xiang Sun et al.[14]verified the perceived risk with seven dimensions, and proposed the sources of risk which had larger impact on consumer perceived risk. Anne-Sophie Cases [15] studied the four sources, and his empirical results showed that secure payment, money-back guarantee and product replacement are the top three risks which will affect the consumer decision-making.

In E-commerce, perceived risk is often a perception held as a natural characteristic by many customers [16, 17]. Greater perception of risk on the part of consumers acts as a deterrent to customer purchase intentions. Several authors have observed that the perceived risk in e-commerce has a negative effect on shopping behavior on the Internet [18], attitude toward usage behavior [19, 20, 21] and intention to adopt E-commerce [22].

Diverse studies have also obtained empirical evidence that supports the effect of perceived risk on consumer purchasing behavior. Cunningham et al. [23] proposed that private risk, product risk and the risk of unknown origin would impact on the online shopping. Based on the investigation for perceived risk and online purchasing behavior, Forsythe and Shi[24] found that perceived risk significantly related to online purchasing behavior, which could explain the barriers of online shopping. Shouming Chen and Jie Li[25] built four structural equation models to measure six dimensions of perceived risk and their influences on consumer

purchase intention. A´. Herrero Crespo et al. [5] studied the perceived risk that would influence consumer's attitudes and willingness for online purchasing.

According to traditional literature on perceived risk dimensions and with the empirical evidence obtained from E-commerce context, considering the risk source from the overall process of B2C and our current cases studied , the definition of the variables used in this study are shown in table1.

Table 1. Definition of variables in literature and proposed in this study.

Variables	Definition	Related Literature and Our Research
Social risk	Potential loss of status in one's social group as a result of adopting a product or service, looking foolish or unpopular.	Cunningham (1967), Stone and Gronhaug (1993)
Economic risk	The potential monetary outlay associated with the initial purchase price as well as the subsequent maintenance cost of the product, and the potential financial loss due to fraud	Cunningham (1967), Stone and Gronhaug (1993)
Privacy risk	Potential loss of control over personal information, when the information is used without permission.	Jarvenpaa and Todd (1997), Featherman and Pavlou (2003)
Time risk	Potential loss of time associated with making a bad purchasing decision by wasting time researching, shopping, or have to replace the unexpected goods.	Cunningham (1967), Stone and Gronhaug (1993)
Quality risk	The possibility of the product malfunctioning and not performing as it was designed and advertised and therefore failing to deliver the desired benefits	Cunningham (1967), Stone and Gronhaug (1993)
Health risk	Potential loss of health because of prolonged use of computer will cause fatigue or visually impaired, pressure on one's heart, or buying counterfeit products which is harmful to one's health.	Featherman and Pavlou (2003) This study
Delivery risk	Potential loss of delivery associated with goods lost, goods damaged and sent to the wrong place after shopping.	Dan Yu et al.(2009) This study
After-sale risk	Potential loss of after-sales associated with products problems, commercial disputes, and service guarantee.	Dan Yu et al.(2009) This study
Purchasing Behavior	The possibility of consumer behavior to doubt, give up, cut down spending, cut down frequency, and to put off one's purchasing because of perceived risks.	This study

From above discussion, the following research hypotheses are proposed:

H1: The perceived risk in the overall process of B2C E-commerce is constructed by eight dimensions.
H2: Social risk has a negative influence on consumers' purchasing behavior.
H3: Economic risk has a negative influence on consumers' purchasing behavior.
H4: Privacy risk has a negative influence on consumers' purchasing behavior.
H5: Time risk has a negative influence on consumers' purchasing behavior.
H6: Quality risk has a negative influence on consumers' purchasing behavior.
H7: Health risk has a negative influence on consumers' purchasing behavior.
H8: Delivery risk has a negative influence on consumers' purchasing behavior.
H9: After-sale risk has a negative influence on consumers' purchasing behavior.

3 Formation of Questionnaire and Data Collection

3.1 Formation of Questionnaire

Based on the related literatures and our previous studies, we designed a questionnaire. Firstly, we summarized all the items about perceived risks and consumer purchasing behavior in the previous studies. Then, after pre-investigating to our colleagues and college students, some items were adjusted. At last, we got our final questionnaire, which included two parts, in part1 there are 32 measurement items, which were used to measure the risk dimensions in the overall process of B2C; in part2 there are 5 items, which were used to measure the consumers' purchasing behavior. We used Likert scale of 1-5 with end points of "strongly disagree" and "strongly agree" to measure these items.

3.2 Data Collection

The data that we employed for this research were collected using interview, investigating online and in business streets from October, 2010 to January, 2011. Just those customers who had shopped on B2C websites before were randomly selected as our respondents. For this research the three main sampling frame people were white-collar from company, blue-workers from factory, and college students from university, more than half of them came from Shenzhen, China. Information was missing on key variables for some of the respondents were deleted. Therefore, we were only able to use information on 388 cases. This number is more than ten times of 37 items, so we can use them for the further analysis. In table2, we provided a description of the respondents that were used in the empirical analysis.

Table 2. Descriptive statistics of respondents' characteristics

Demographic variables	Percentage number of respondents	Demographic variables	Percentage number of respondents
Age: Age of the respondent		Experience of online purchasing	
18~24	67.5	≤3	32.5
25~30	19.3	4~8	28.6
31~34	8.0	9~15	21.9
≥35	5.2	≥16	17
Gender of the respondent			
Male	54.1		

4 Data Analysis and Results

4.1 Measurement Model Analysis

Exploratory factor analysis is used to extract a number of common factors. Firstly, SPSS17 was used to test the KMO and Bartlett's test of sphericity. The KMO of part1 is 0.836, Bartlett's test the p value is 0.000. The KMO of part2 is 0.882, Bartlett's test the p value is 0.000.These values indicate that the data from our questionnaire are acceptable to perform further factor analysis.

Then, for part1, we got 30 items kept in, by using principal component analysis method and variance maximization rotation, two items T31 and T32 are deleted because their rotated factor loadings are less than 0.4. Their factor loadings are shown in Fig.1 and variance contribution rates are shown in Table3. Finally, eight common factors are extracted from the remaining 30 items. The cumulative variance contribution rate is 88.627%, which could be used to analyze the contents and types of perceived risk for the overall process of B2C. We also got one common factor from part2. They are shown in Table3.

According to the integrated meaning of the common factors, we named the eight common factors as follows: perceived health risk(PHR), perceived quality risk(PQR), perceived privacy risk(PPR), perceived economic risk(PER), perceived time risk(PTR), perceived social risk(PSR), perceived delivery risk(PDR) and perceived after-sale risk(PAR). For the one common factor from part2, we named it as perceived purchasing behavior (PPB).

We use Cronbach's α coefficient to conduct reliability analysis. Table3 shows that α value of each dimension is greater than 0.8. The result indicates that the survey data in our research are true and reliable. In addition, the composite reliability value CR of each dimension is greater than 0.9, which indicates that our survey data have a high reliability.

In this paper, we used average variance extracted (AVE) values to test the convergent validity and confirmatory factor analysis for testing discriminate validity. Table3 shows that the AVE of each dimension is greater than 0.7, therefore, the survey data in our research have a good convergent validity.

Table 3. Risk dimensions and purchasing behavior α, CR and AVE value

Dimension	Item	Variance Contribution	α	CR	AVE
Perceived Health Risk(PHR)	T2,T1,T4,T3,T11	17.245%	0.923	0.944	0.772
Perceived Quality Risk(PQR)	T25,T24,T26,T23,T27	27.059%	0.914	0.940	0.768
Perceived Privacy risk(PPR)	T15,T17,T16,T22	8.129%	0.875	0.954	0.841
Perceived Economic risk(PER)	T13,T14,T12	7.896%	0.886	0.930	0.819
Perceived Time risk(PTR)	T30,T28,T21,T29	13.079%	0.905	0.934	0.780
Perceived Social risk(PSR)	T6,T7,T5	7.116%	0.843	0.954	0.872
Perceived Delivery risk(PDR)	T18,T20,T19	4.554%	0.907	0.922	0.798
Perceived After-sale risk(PAR)	T10,T8,T9	3.509%	0.858	0.921	0.797
cumulative variance		88.627%			
Perceived Purchasing Behavior (PPB)	J1,J2,J3,J4,J5	90.380%	0.873	0.913	0.9035

4.2 Structural Model Analysis

We conducted confirmatory factor analysis (the risk dimensions model) for the survey data with AMOS 17. The fit indexes of the hypothesis H1 are shown in Table4. These indexes are above the recommended levels. The indexes in Table4 show that there is a good goodness-of-fit between the dimension model and the survey data. H1, which assumes that there are eight dimensions of perceived risk in the overall process of B2C, is supported.

The results confirmed the existence of eight dimensions. These dimensions showed no-cross construct loadings above 0.5, indicating good discriminate validity. The hypothesis H1 is verified.

Table 4. Goodness-of-fit indexes of the dimensions model

Indexes	χ^2	df	χ^2/df	NFI	IFI	CFI	GFI	AGFI	RMSEA
recommended levels	-	-	<3	>0.9	>0.9	>0.9	>0.9	>0.8	<0.08
the risk dimensions model	658.43	372	1.77	0.951	0.981	0.981	0.923	0.916	0.046
the purchasing behavior model	941.257	519	1.81	0.947	0.971	0.971	0.913	0.906	0.055

We also built the purchasing model, which is used to verify the hypothesis H2-9. The indexes in Table4 show that there is a good goodness-of-fit between the purchasing behavior model and the survey data. The path coefficients and significant levels of the study model are given in Fig.1.The results show that hypotheses H5-9are supported.

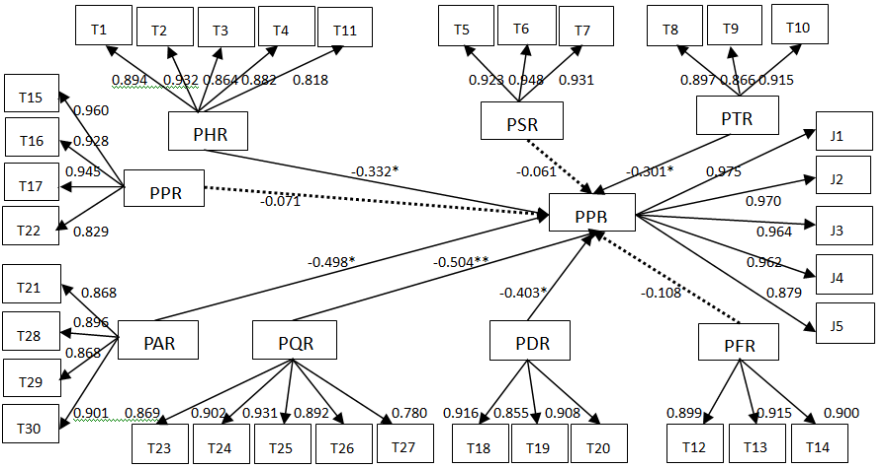

Fig. 1. Study model with path coefficient

5 Discussions

The results show that H5-9 are supported. H5, which assumes that time risk has a negative influence on consumers' purchasing behavior, is supported. Consumers are not patient to wait a long time because they usually take delight in seeking new thing, so a longer waiting time for delivery and service would make them lose their interested in and affect their online shopping willingness. For H6, the result shows that quality risk has a significant negative influence on consumers' purchasing behavior. Most consumers prefer products with low prices but first good quality is the principal criteria. H7, which assumes that health risk has a negative influence on consumers' purchasing behavior, is supported. Most consumers like to spend much time on Internet, especially the young people. But much adverse information, stay online too long or counterfeit goods bought from online shopping would affect their physical and mental health. For H8 and H9, the results show that delivery and after-sale service risks have significant negative influences on consumers' purchasing behavior, especially in B2C E-commerce. When consumers perceived the potential problems in delivery such as goods lost, damaged, or delivered to a wrong place, they would put off the purchasing online. Sometimes once they think it's difficult to solve commercial disputes and haven't after-sales service guarantee, they would give up their purchasing online.

A major finding of this study is the non-significant of economic risk on consumer purchasing behavior, likewise social risk and privacy risk. In this study, we concern whether the additional fees caused by the difference between online shopping and offline shopping may impact consumers' purchasing behavior. The result shows it is not significant. We believe that even the counterfeit goods may cause economic losses, but for most vendors who have "seven days unconditional return" can reduce the economic loss. Besides, guaranteed by Alipay in China,

banks, credit cards companies as intermediaries. These intermediaries usually guarantee a refund or other improprieties result in economic loss. As Internet usage has come of age such that the online customers now view security and privacy as a basic requirement, it may help us explain why perceived privacy risk is not significant impact on online consumer.

6 Conclusions

There are abundant research on the effect of perceived risk toward the purchase decision and the determinants of buying intention in online context. To date, attempts to study both risk dimensions and consumers' purchasing behavior jointly have, however, proved insufficient and have lacked depth. Thus, we have examined such important variables as perceived risk dimensions in the overall process of B2C, and the impacts for each of them on consumers' purchasing behavior. At the same time, an additional contribution of our study lies in the consideration of consumers' purchasing behavior and perceived risk as multidimensional concepts.

This research provides a new perspective to study the construction of perceived risk dimensions, which lay the foundation for further research on B2C shopping online decision-making.

Implications of both a theoretical and practical nature also emerge from our study. The former, concerning the consideration of perceived risk toward consumers' purchasing behavior in the overall process of B2C as a eight-dimensional construct –quality risk, health risk, delivery risk, after-sale risk–opens up new avenues of research. Not only are individuals involved in B2C online transactions, but are also involved with the process before buying and after purchasing online. Our research is also empirically innovative, as it has examined different dimensions of risk and performed a separate analysis of the effects of each dimension on consumers' purchasing behavior. Furthermore, we had considered the role played by quality risk, health risk, time risk, delivery risk, and after-sale risk, in consumers' purchasing behavior, which are more relevant in the online behavior of individuals than social risk, privacy risk, and economic risk.

There are some limitations in this paper. As the group's resources and energy are limited, the main source of this survey data are from Shenzhen, this may affect the respondents broadly representative. In future studies, we should consider the influences of individual characteristics of the respondents such as gender and experience on the composition of perceived risk dimensions and analyze their different influences on consumers' purchasing decision-makings.

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Research on the Mode Selection of Technology Transfer and Innovative Process

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Abstract. The formation process of technology transfer pattern is closely related to the general, mature and application of technology. Technology transfer is a main factor making technology turned into productivity successfully. Both providers and receivers of technology transfer should choose technology transfer modes that meet their own conditions, including basic conditions and technical conditions. For enterprises and institutions of universities, technology transfer process is in fact the selection process of technology transfer mode, which often determines the application effect of technology and economic benefits. This paper analyzed domestic and international technology transfer process and practice between university and enterprise firstly, and then researched cooperation ways, systems, conditions, contracts for constrains and distributions of interests. Analyzing cooperation rules and systems of technology transfer, it is considered that mode selection and process are the key factors to influence effects of technology transfer.

Keywords: technology transfer, mode, conditions, research.

1 Introduction

In recent years, science and technology effectively promote the development of productive forces, which gradually becomes a key productivity element to economic development together with traditional material elements. But it needs a complicated process to turn elements into productivity. Technology transfer is crucial for science and technology to upgrade productivity level [1].

Researches in university should focus on domestic and international science and technology development frontier. Research projects potential to be industrialized take improving productivity as the target. Once basic engineering technology theoretical achievements that have the application prospect in the market were tested and verified by theory, the next step should be application research and development. Enterprise is sensitive to market and driven by potential benefits, which is the cooperation foundation between enterprise and university on technology transfer. From this basic point, the effective technology transfer from universities to enterprises can realize targets and interests of both sides.

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2 The Comparison and Selection of Technology Transfer Modes

2.1 Technology Transfer Modes

(1) Technology transfer mode. University as technology owner provides technical achievements to enterprise, and the technology receiver pay certain amount of remuneration to the technology provider. University provides technology and achievements possessing potential commercial value for enterprise to purchase and use in the forms of the technology authorization, technology license, technology consultation and technology service. It's the duty of university as a technology transfer "source" [2].

(2) Participation through cooperation mode. On the basis of resource integration, the enterprise takes participation in the technology transfer together with university by contracts. This promotes the transformation from technology to realistic productive forces and improves enterprise's technology innovation ability. Generally, enterprise advances into technology research and development when university has no technical achievements but only certain technology or technical ability. Meanwhile, university also often involves in follow-up parts of the technology transfer, providing the necessary technical supports and services.

(3) Establishing enterprise mode. Research agency in university taking his talents and technology as the foundation sets up an enterprise aimed at product manufacturing and service using the technical achievements in university with investment of others. In general, this mode has two necessary conditions: first, the member cooperating with university in technical development is one of enterprise founders; second, the enterprise's core technology is transferred from university.

So high technology transfer needs more close cooperation between university and enterprise [3].

2.2 The Main Process in Technology Generation and Transfer

To realize the technology transfer, there are three necessary stages- laboratory, engineering and industrialization. The degree university and enterprise participate in these stages decides technology transfer mode. In the technology transfer mode, laboratory stage accomplished by university independently, while the stages of production, commercialization and industrialization are realized by the enterprise. University transfers its own R&D achievements to enterprise directly through technology market.

In the participation through cooperation mode, the first two stages of technology transfer are completed by jointly, and the final commercialization and industrialization stage are completed only by the enterprise. In the establishing enterprise mode, university involves in all three stages of technology transfer. University sets up an enterprise itself or invests in the enterprise with its technical achievements or proprietary technology license and holds larger percentage shares in these enterprises.

3 The Guarantee Factors of Technology Transfer

3.1 Basic Conditions

(1) The preparation of technical basis. Rely on technology innovation platform with optimized resource configuration, the university's research centers, key laboratories, science and technology innovation platforms mainly focus on basic research as well as application technology. Taking the advantages of talents, knowledge, technology and information, the university tacks scientific research subjects which are original and frontier, or related to national security and economic development, and creates technological achievements in basic application constantly. This not only trains technology innovation talents and strengthens innovation ability, but also gradually lays the foundation to improve productivity level.

(2) Preparation of technical achievements. Technological research centers, engineering research centers and university's science and technology zones formed by interdisciplinary and border-crossing develop high-tech integrated achievements owning competitive advantages in the market in special. These agencies seek production-teaching-research combination partners of intensive technology and talent to develop technological achievements possessing self intellectual property rights and certain application prospect and valued by enterprise.

3.2 Technology Conditions

(1) Advanced technology achievements are the guarantee of technology transfer. Engineering-oriented basic theoretical research achievements must be advanced, and recognized by industry and market economic forecasts. Also they possess the practice of engineer application and the basic conditions of technology transfer.

(2) The participation of technical personals is the guarantee of technology transfer. During the process of technology transfer, there are still some problems even if the technology can be developed in the actual application. In reality, the both sides of co-operation tend to have different understanding on technology transfer. It takes a period of time to reach an agreement and create the software and hardware conditions for technology transfer. In addition, there is another problem that the implementation personnel are inseparable from technology in the process of technology transfer. To sign the technical service contract with technology personnel as constraints of technology transfer, can make sure that technical personnel work wholeheartedly until technology transfer completed. According to commercialized requirements, technology receiver cooperates with technical personnel closely and develops product production technology after receiving technical achievements [4].

(3) The sustainability of technology research. Technology provider needs the stamina in technology research and development. When it cooperates with technology receiver, engineering research on next product has already been conducted. This way can achieve technical reserves to renew products, guarantee the sustainability of technology transfer process and meet product market demand.

4 Exploration for Innovation Mechanism of Technology Transfer

There are two inner connection lines when university transfers technology to enterprise. The university provides innovative technology achievements to the enterprise, and then converted into products manufacturing technology and products by enterprise. Products are transformed into commodity by industrialization after gaining market acceptance. This is called technology chain. On the other hand, enterprise use capital to purchase products technology from university and the capital is invested to innovate knowledge and technology results continuously, which is called capital chain. Thus the cycle is formed between technology chain and capital chain. University mainly researches engineering while enterprise mainly realizes industrialization. Enterprise's timely intervention realizes the seamless link in the technology transfer process.

It is critical that technology transfer is operated within the standard system. Both technology provider and receiver have been familiar with their respective operation and rules before the operation mode and rules, and can complete whether application research or production independently. But in the framework of enterprise, technology transfer must suffer a series of constraints such as cooperation agreement, proprietary technology license, terms of technical services. Enterprise's management, human, distribution, incentives and rewards and punishment system related to technology transfer, regulate the personal responsibilities and interests for both sides. Mobilizing personnel's subjective initiative fully, coordinating the problems and seeking the best way to solve the problem are the fundamental expression of good operation mechanism.

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ARCH Model Approach to Measuring Function of Government in the Science & Technology Auto-organization System

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Abstract. To assure stable transformation of science & technology reform in China, function of government should be relocated in the science & technology system. ARCH model is adopted to make an empirical analysis to study the function of government in the science & technology system. The results indicate that there is obvious difference in science & technology mechanism between western market economy and ours. In China, science & technology can not reach stable state by its own force, except for exterior force. Under the condition of incapability of science & technology system to stabilize itself, exterior intervention of government on science & technology system is the premise for stabilization, otherwise, it will plunge into fluctuation.

Keywords: ARCH, Exterior Intervention, Failure of Market, Science & Technology System.

1 Introduction

As a subsystem of economy system, science & technology system has function of auto-stabilization and auto-organization. Auto-organization inducts the system to the greater negative entropy, results in the system being apart from equilibrium state, which causes system to fluctuate in great breadth. Auto-stabilization keeps the system under the foregoing organizing state, namely it has the function to eliminate fluctuation and return to equilibrium state. When systematically analyzing the fluctuating mechanism of Chinese science & technology system, we should distinguish the exogenous impact and endogenous conducting mechanism. Endogenous conducting mechanism is auto-regulation mechanism between variables in inner science & technology system and reaction to exogenous impact, represented as distributing lagging relation in Mathematics form, which reflects the endogenesis of science & technology activity. What is called the exogenous impact mechanism means science & technology activity caused by exterior impact through interior conduction. Exogenous impact mechanism roots in spontaneous change of exterior variables which leads to science & technology system stochastic or periodic change. Thereby, it comes to conclusion that exogenous impact is an

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important cause of science & technology system fluctuation; endogenous conducting mechanism is auto-response and auto-adjustment in answer to impact in interior science & technology system. Under synthetical effect of the two functions, fluctuation can be revised and eliminated incessantly through auto-stabilization. In the paper, the author reviews and analyzes the dynamic character of science & technology system operation in China, so as to identify the auto-stabilization and auto-organization effect on science & technology system respectively. At the same time, we appraise the performance of science & technology system to bring forward an analysis framework for government decision-making in the reform of science & technology system.

The issue of the function of government in the science & technology system arouses widespread concerns [1,2,3]. But most of relative literatures usually adopt qualitative approach, whereas quantitative analysis is inadequate. So it is necessary to make more in-depth and comprehensive analysis for the sake of providing an empirical support for government's function in the science & technology system.

2 Data Selection and Statistic Analysis

Science & technology input and science & technology output are the main elements in science & technology system. Generally, science & technology input is denoted by science & technology expenditure, science & technology output is denoted by the number of patent application and acceptance or the number of dissertation. In the paper, we decide to use science & technology expenditure as science & technology activity, Sample data involve 1953-2008.The reason lies in the following two points, above all, the problem of obtaining science & technology output data. At first, we consider to review the fluctuation character of science & technology system from the input and output respectively. But after checking relative data, we find that there is lack of data of patent application and acceptance before reform in china. Generally, more than 50 sample data are needed when using ARCH model. If selecting merely approximately 20 years patent data, it can not reflects completely the fluctuating character of science & technology output in China because of lack of time series; in addition, there is strong relationship of fluctuation between science & technology input and output, we calculate the pill correlation coefficient of expenditure and patent application with data since 1985. The result indicates that there is prominent relationship between the two variables. $r=0.9210(p=0.0025)$. Based on the above analysis, we believe that the variable of science & technology expenditure can better reflect the character of science & technology system.

We select 1953-2008 year data as samples, data come from «China Stat Annals»and «China Scientific Stat Annals».Since 1953, Chinese science & technology expenditure is ascending gradually. For the sake of eliminating shrewd fluctuation of variables, we switch the science & technology expenditure by logarithm, namely lnE. To obtain the fluctuation rate, we switch the data to yearly fluctuation R_t with first difference. Namely $R_t=\ln E_t-\ln E_{t-1}$. Figure1 is the yearly fluctuation rate series of science & technology expenditure.

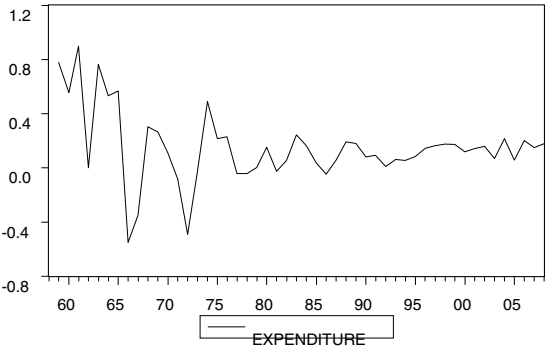

Fig. 1. Science &Technology expenditure yearly fluctuation rate in China

Table 1 indicates that series R_t is not equal to zero remarkably, difference between maximum and minimum is rather great. Positive value of skewness means rightward incline of fluctuation. From the data of kurtosis, we can find that the distribution has the character of obvious wide trail, with acuate wave crest at mean point. Result of JB test approves that science & technology expenditure fluctuation rate does not obey normal distribution. Result of Q statistic indicates series R_t has the character of obvious auto-correlation. So we consider describing it with auto-regression moving-average model (ARMA). Result of Q^2 statistic indicates series R_t has the character of obvious heteroscedasticty. Thereby, we can consider establishing ARCH model. At the same time, from the table 1, we can find that series R_t takes on character of obvious "fluctuation clustering", namely past harass has obvious impact on system, great extent of fluctuation centralizes in certain period, and small extent of fluctuation centralizes in other period. From the table, we can see that fluctuation rate of preceding series R_t is greater than that of posterior series R_t. Time dividing point basically is consistent with system reform in China. So the impact of system reform on the science & technology fluctuation should not be ignored.

Table 1. Describing statistic of scientific expenditure in China

Mean	Median	Maximum	Minimum	Standard
0.1486	0.1310	0.9245	-0.5801	0.2674
Skewness	kurtosis	J-B	Q(24)	Q^2(24)
0.5849	6.9800	156	115.21	55.01

In order to study the system transition effect on science & technology fluctuation, we introduce a dualistic variable. Before the reform and opening (1978), science & technology administration in china adopted strict planed system, thus suppose D=0; after the reform and opening, science & technology administration has been deepened and reformed under the framework of market economic system.

3 Empirical Analysis Based on ARCH Model

First, we carry through the unit root test of time series before establishing ARMA model[4]. Here, ADF method is used to test stabilization of series. The results: ADF test value equal to -4.4308, less than critical value(-3.5713) at 0.01 significance level. Based on the results, series R_t is stationary series, thus we can consider establishing auto-regression moving-average model (ARMA). After repeated experiments with AIC and SC criterion, series R_t choose ARMA(2.1)process finally.

$$R_t = 0.0910 + 0.9070R_{t-1} - 0.2990R_{t-2} - 0.9660\varepsilon t + 0.06D$$
$$(14.24^{***})\ (6.36^{***})\quad (-2.78^{*})\quad (-21^{***})\ (3.21^{***})$$

Apparently, coefficient of system variable D equal to 0.06.and pass T test, which illuminates that system variable impact on science & technology system is significant. After using Ljung-BoxQ statistic to test error series in estimating model, we find that error series is not auto correlative on the whole. Thus, it is appropriate to use above model to depict autocorrelation of series. But after carrying through normal distribution test on error series ,we find that skewness coefficient is greater than zero, kurtosis coefficient is greater than 3, distribution presents the character of "acuate apex and thick trail", which means that ARCH effect exists in error series.

Above analysis indicates that series R_t has the character of heteroscedasticty . LM (8) test in ARMA(2,1) model reveal random error has ARCH process. Due to lagging period being too long, so it is appropriate to depict heteroscedasticty with GARCH model[5]. We estimate the equation based on ARMA (2,1) with QML method. After eliminate insignificant parameter step by step, we reserve only AR (1),AR(2) item.

Table 2. Estimation of GRARCH(1,1)

Table .	coefficent	Std.error	z-statis	prob.
C	0.000460	0.000223	2.061538	0.0393
ARCH(1)	-0.138479	0.051469	-2.690553	0.0071
GARCH(1)	1.026217	0.078265	13.11203	0.0000

From the reslults ,we can see that coefficient of ARCH and GRACH model is not equal to zero significantly, which means heteroscedasticty of model is apparent.

4 Results and Comparison

When analyzing the fluctuation character of science & technology system with GARCH(1,1) model, coefficient(α+β)reflects the duration of system flctuation. TerenceC.Mills (1999)believed that coefficient(α+β)in auto-regression conditional heteroscedasticty model acts as criterion judging whether time series is stable. As to science & technology system, it can reflect duration of the science & technology system fluctuation. If(α+β)<0, fluctuation imapct on conditonal variance is limited, i e. Conditional variance shorked by exogenous factor will be regressed toward mean value as the time elapses. If (α+β)=1, fluctuation imapct on conditonal variance is permanent. Owing to fluctation rate of the variable =constant+β* previous fluctuation rate of varialbe+α*exogenous shock. Thus, β reflects the memory of system flctuation, α reflects the exogenous shock impact on system fluctuation, i e, the greater the β, the strongger the memory of system flctuation. Especiallly, when β>1, science & technology system itself magnify previous flctuation. When α>0, the greater the α, the stronger the exogenous shock impact on science & technology system, when α<0, exogenous shock help to stabilize science & technology system. Coefficient estimator of GARCH(1, 1) model are listed in Table 3.

Table 3. Coefficient estimator of Science & Technology System in China and American

	ARCH α	GARCH β	α+β
American	0.1214	0.8356	0.957
China	-0.1385	1.0261	0.887

We analyze the coefficient α and β respectively. Firstly, in China, β>1, science & technology system itself magnify the previous fluctuation. it means that science & technology system can not achieve state of stablilization relying on itself force . Only by exterior force can it stablilaize the flctuatuion of science & technology system.; as to American science & technology system, β<1 meas that previous system flctuation has been cleared off at the present time, science & technology system has the capability to stabilaize fluctuation automaticly. Secondly, α<0 in China indicates that previous exterior shock can reduce the present system fluctuation. On the contrary, α>0 in American indicates that exterior shock will increase the fluctuation of system, thus science & technology system has the capability to counteract exterior shock by inherent mechanism, which indicates the mature of marketing mechanism in American. Fluctuation duration of science & technology system (α+β)in china is less than that of american ,which means that the time of shock impact on flctuation is shorter than that of american. From the other aspect , it illumimates that science & technology activity are dominated and inducted by

government. Owing to goverment participation in science & technology activity, when system appears feasibility of fluctation, goverment will intervene to control the flctuation under its admissive scope, as a result, duration of fluctuation of system is limited.

5 Conclusions

Despite that our aim of science & technology system reform is to breed market – oriented innovation system. But we should notice that due to effect of inhere system inertial, our science & technology system transformation keeps to "gradual path". Under this especial circumstance, it is important to maintain the stabilized transition. Although many problems in science & technology activity are aroused by government interference, it is not appropriate to reckon that government should retreat from science & technology activity for ever. Considering science & technology system lack of auto stabilization mechanism($\beta>1$), at present , science & technology system should depend on goverment inteference to stabilize its function, otherwise, science & technology activity is likely to plunge into smart flctuation which contravene the orginal intention.

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Research on New Patterns of Fostering the Innovative Ability in China's Graduate Education

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Abstract. Graduate education in China is entrusted with dual mission of cultivating highly qualified elite and innovative talents as China's growth strategies of building an innovative country and its reinvigoration are both rooted in fostering innovative proficiency of graduates in the knowledge-based economic era. However, there is much of deficiency in the graduate education covering from curriculum setup, cultivation process, teaching management to fostering patterns which has confined the development of graduates' innovative ability. The purpose of the study is to find out the restrictions of the traditional cultivating patterns in innovative ability-building and to work out the applicable new pattern of fostering the innovative ability in graduate education.

Keywords: innovative ability, fostering pattern, academy-oriented/pragmatic proficiency-oriented.

1 Introduction

With accelerated integration of the world economy, the global competition has been more typically reflected in talent competition in the 21st century. The aim of China's graduate education is at providing high-level and high-quality of personnel. Accompanying the economic opening-up and reform, China also started to resume the recruiting of graduates and has made rapid development. In 2009, Chinese graduate enrollment has reached 1.4 million. With the rapid growth of graduate students, the quality of graduate education and the innovation ability of them have not increased correspondingly. Chen Zhili, pointed out at the 25th State Council Academic Degrees Committee Conference that there still exists a big gap between the world postgraduate education and that in China. The main problem lies in the weak innovation ability fostering of China's students. As compared with the postgraduate training quality in the advanced countries, we can see that the postgraduate training system and training mechanism is relatively backward. Moreover, it is short of funds and it is also lack of innovative spirit and motivation. In fact, most students are still lack of innovative ideas and desire, and the teaching methods and the teaching system are blamed for. The postgraduates are

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educated to accept instead of creating, in addition, the students are negative to do something. Very few students concentrated on academic research or empirical study. Although many schools provide corresponding research platform system security and policy support for graduate innovative ability, it is critical of improving innovation ability of graduate students since the postgraduate education is an important channel to cultivate high-end talent, and we should cast more care to the quality level of the postgraduates.

Innovative ability is the core and the critical factor among the training of overall quality of the postgraduates. At present, we need to fill the big gap between China's postgraduate education and the developed countries.

2 Innovation Ability of Graduate

2.1 The Meaning of Innovation

Innovation is also known as creativity. In other word, innovation is a human behavior which uses existing natural resources or social community elements to create the new contradictory community, or he can think about what replaces and covers the old things. According to the content and nature of innovation, it can be divided into three categories:

- **Creative innovation.** The content and nature of innovation is a new discovery, new inventions or new theories which are not exist before.
- **Negative innovation.** The content and nature of innovation is the push over the previous theory, it belongs to negation of the negation.
- **Inheritance innovation.** The content and nature of innovation inherit and apply the previous theories and technological achievements and combine their own practice to get the discovery and invention.

The nation of China pays much attention to innovation. We can find the proof in the ancient four great inventions. Nowadays every leader has attached great importance to innovation. China's former President Jiang Zemin once mentioned in his report that innovation is not only the soul of a nation's progress and is inexhaustible motive force of the national prosperity and development, but also is the source of eternal vitality of a political party. If a country cannot improve its independent innovation capacity, by blindly relying on technology transfer, it will be difficult to get rid of the situation of technological backwardness. It is difficult to stand among the world's advanced nations without the innovation capability of a nation. President Hu Jintao also called for constructing China into an innovative country in 15 years at the National Science and Technology opening ceremony on January 9, 2008. One of the major strategic tasks is to improve independent innovation ability during the eleventh five-year-plan era. The leaders have emphasized innovation and raised it to the height of the national strategy. We can clearly see the significance of innovation to a country. To persevere in cultivating innovative talents is a request of improving the capability of independent innovation and building innovation-oriented country. Based upon this, we need to uphold strategic

idea that the talent resources are the primary resources and to step up the construction of innovative technology talent.

2.2 The Importance of Innovation Ability

The 21st century is "knowledge-based economic era." In the knowledge-based era, the country's innovation ability, including knowledge innovation and technological innovation, is an important factor which can determine a country's status of international competition and the position in the world. The postgraduate education is the most high-end of education chain, which is an important part of national innovation, and innovation ability of postgraduate becomes the key and the soul of graduate education.

"2003~2007 Action Plan for Invigorating Education" proposed "Implementation Innovative Plan of Graduate Education" aiming at further exploring new law of graduate education, renewing ideas, deepening reform, promoting innovation and establishing graduate education system and operating mechanism in order to adapt to market economic system. It also strengthens the construction of the bases for graduate students and improves the cultivate conditions as well as promotes the sharing of quality resource. It will establish the mechanism of innovation incentives of technology research, and create an innovative environment, cultivate the sense of innovation and innovative spirit and motivation. We should spare no efforts to develop the quality of postgraduate education and catch up with the level of developed countries so as to lay a solid talent base for the implementation of technology and education strategies.

With the rapid development of China's economy, it has stepped into a transition period. China needs innovation talents to further promote its strength in many aspects. The postgraduates serve a dynamic force in the research work, and they are also the reserve team of the whole state scientific research and university teachers. Their quality level, especially in the innovation ability is closely related to the country's future development. Graduate education is an important national force of training high-level personnel, promoting the advanced productive forces and advanced culture and achieving sustained and rapid development. Graduate students may become backbone of the country's political, economic, cultural and other areas and serve as an important driving force. Therefore, it is of great need to pay more attention to the education of postgraduate and cultivate their innovation and creativity.

3 The Restrictive Factors of Innovation Ability

The number of graduate students reached to 1.4 million in 2009 compared with the number of 0.39 million in 2001, and the number of graduate tutor reached to 0.24 million in 2009 compared with the number of 0.1 million in 2001. The number of graduate students and graduate tutor obtain great development, but there still exists many problems in training innovation ability of graduate students. Actually there are many factors limiting the innovation ability of graduate creativeness.

The Cultivate Model Is Single. At present, cultivate model of graduate is single and they are relatively passive to study. The graduate education is mainly theoretical teaching. Students are less motivated to put forward questions, they just swallow the teacher's lectures. The theoretical courses in the curriculum account for a big proportion and practical courses are restricted. What's more, the subjects they learn are narrow lacking of cross-disciplinary content, leading to narrow and academic-type of learning which is highly lack of research ability training and practice-type of training.

The Teacher-student Ratio Is Too High. As the rapid expending of graduate enrollment, the number of graduate students has grown from 0.39 million in 2001 to 1.4 million in 2009 by 3.6 times while the number of graduate tutor has increased from 0.1 million in 2001 to 0.24 million in 2009 by 2.4 times. This will inevitably lead to the tutors who are lack of time to guide and educate their students. As a result, some students will be trapped in "sheep-style" management and do nothing at school (Referring to Table 1).

Table 1. Scale of Graduates and Tutors

Year	Number of Graduates from School	Growth of Graduates	Number of Tutors	The Growth of Tutors	Ratio of Graduates to Tutors
2001	393256		101097		3.889888
2002	500980	0.273928	115462	0.142091	4.338917
2003	651260	0.299972	128652	0.114237	5.062183
2004	819896	0.258938	150798	0.172139	5.437048
2005	978610	0.193578	162743	0.079212	6.013223
2006	1104653	0.128798	188835	0.160326	5.849832
2007	1195047	0.08183	206034	0.09108	5.800242
2008	1283046	0.073636	223944	0.086927	5.729316
2009	1404942	0.095005	239857	0.071058	5.857415

Source: Statistics from China's Ministry of Education.

The Quality of Graduate Tutor Is to Be Improved. Cultivate mechanism of China's postgraduate education count mainly on academic tutors. Therefore, the level of the academic tutors, their teaching methods and their time of supervising determine the quality level of the postgraduate students.

With the continuous expanding of graduate enrollment, the number of graduate tutor has increased to an extent. However, every year there are many young tutors attending this rank, who are short of experience and it is really beyond their ability. Even if the tutors have the ability to guide the students, they are busy with their normal undergraduate teaching or with their own survival.

The Impact of Examination-oriented Education Is Deep-rooted. Our approach of education is around the traditional examination mechanisms for decades. Most of the students, teachers and parents only pay attention to the learning of basic knowledge and theories. It is not their concern whether they turn theories or principles to knowledge or ability, as long as their scores are high. In consequence, the

students develop conservative ideas slowly, suppress their imagination and creativity. Post-graduate experienced more examinations and are more deeply and longer affected. From this aspect, it seemed more difficult to train innovation ability of graduate students.

Graduates Have Turned to Be Cheap Labors. Tutors are called boss. It may lie on that the students have to work for their tutors, and sometimes get paid especially those graduate students in science and engineering. It is true that appropriate work can train the graduate students. However, if most energy is exerted on helping their tutors do the project, students have no time to work on their own plans.

Postgraduates Are Lack of Motivation. Motivation is an instinct which is used to stimulate and sustain the individual activities and the internal psychological tendencies or internal power which makes the activities towards to a certain goal. Stepping into the stage of postgraduate, many students neglect their studies. In one hand, many of them are not sure of their goal of learning and striving even before they chose to take the exams to postgraduate study. On the other hand, some students just want to get a diploma to find a better job afterwards.

4 The Cultivate Models of Innovation Ability of Graduate

Based on the above discussion, we can draw some conclusions to improve the innovation ability of graduate.

To Change the Single Training Model. Graduate training programs should be based to broadened aspects, with strengthening the application and innovation. It should be instructed to guide the students to train themselves in the abilities in professional profile training, and academic research talents. Teacher or tutors should try different models of training the postgraduates according to their interests. Tutors should instruct students to set up their strategies in innovation ability building, so that students can really have the ability of finding problems, analyzing and solving problems.

To optimize graduate courses and to establish a reasonable and complete graduate courses system is critical. Tutors can use advanced teaching methods and flexible teaching methods and guide the graduate students to interact in the teaching and learning. Under such teaching atmosphere, it is helpful for the students to improve their research and creativity ability as well as their innovation ability.

To Build a Tutor Team. According to the situation that the level of current tutors is restricted and the proportion of tutors to graduate students is not applicable, we should strengthen the construction of tutor team in order to supervise students and to improve the quality of postgraduate students.

First of all, there should be a team of tutors with experienced teachers to instruct the young teachers who will play major role in the future instruction of postgraduate students. Secondly, the expending scale of graduate enrollment should match with the postgraduate tutors. Thirdly, the joint training mechanism of involving high level of external academic professors and entrepreneurs and internal tutors should be established. It can smooth the contradiction of expanding

enrollment and shortage of tutors. Fourthly, due to the wide disparities among the tutors, it is necessary to offer continuing study for the tutors to enhance their knowledge in new areas.

To Grasp the Quality of Graduate Training from the Sources. From the entrance exams to the re-exam, it is critical of strictly controlling the quality of new enrollment. First of all, actively the universities should promote the admission policy for the outstanding students of re-choice. Secondly, the universities should offer various ways to recruit new students. Since 2008, after setting up the payment systems of half fees and free fees for the outstanding students, the quality of students has been improved significantly. In addition, in the re-examination, the universities should focus on overall quality of innovation and professional capability. They should not ignore the major role of tutors in the interviewing process.

To Strengthen the Role of Government in Encouraging the Collaborate between Universities and Enterprises to Build a Platform for Cultivating Innovation Ability of the Postgraduates. Combining study, research and practice is an applicable way of cultivating innovative spirit and ability. It can also guide the postgraduate students to be fully involved in social practice and provide them with opportunities of innovation, stimulating them to create. The governments at different levels can encourage the co-operations among universities, research institutes and the enterprises by issuing suitable policies and regulations in favor of the collaborates for the three participants. Moreover, financial support from the Ministry of Education is needed to cover the co-operations. Under these circumstances, the governments need to provide better conditions for cultivating innovative ability of postgraduate students.

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Social Network's Impact on New Venture Performance—An Empirical Research of Zhejiang Entrepreneurs

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Abstract. Entrepreneurial network possesses a significant influence on new venture performance, but there are little articles studied it on the basis of entrepreneurs' characteristics in a certain region. Based on social network theory, entrepreneurial theories, and previous researches, this paper analyzed the characteristics of Zhejiang entrepreneurs and their social networks in detail, discussed the impact that social networks exerted on new venture performance. With the data of 130 valid samples in Zhejiang, through an empirical analysis, we found that highly educated Zhejiang entrepreneur groups showed a rising trend, entrepreneurial network was equally important for different entrepreneurs and new start-ups, and that entrepreneurs' social network size and network strength can indeed promote the development of enterprises and the economic efficiency.

Keywords: Entrepreneurship, Social Network, Entrepreneur, New Venture Performance.

1 Introduction

In 1985, Granovetter's article [1] published in *American Journal of Sociology* indicated that the position entrepreneurs embedded in business network, the network structure and the other related subjects jointly promote or restrict entrepreneurial activities. Since then, business networks' impacts on entrepreneurial activities attracted more and more researchers' attention (Krackhardt, 1995; Hite & Hesterly, 2001; Hite, 2005). Other scholars' plentiful studies have also confirmed that entrepreneurs' social networks have positive influence on new venture performance (Ostgaard & Birley, 1996). Researchers in China have also carried on many studies about entrepreneurs' social network, but the studies on the relationship between social network and new venture performance based on regional features are less.

The success rate of entrepreneurship in Zhejiang province ranks ahead in China and it is in the mass entrepreneurship era at present [2]. For entrepreneurial network played an important role in entrepreneurs' success and for entrepreneurial success exists district difference, putting Zhejiang entrepreneurs, whose entrepreneurial success rate is high, as research object, researching the relationship of entrepreneurs' social network and new venture performance has great significance.

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Considering the lead trend of Zhejiang entrepreneurial activity, we will analyze Zhejiang entrepreneurs' group features and study their social networks' impacts on new venture performance on the basis of the analysis in this paper.

2 Theoretical Analyses

2.1 Social Network Theory

Birley introduced the concept of social network into entrepreneurship field in 1985 [3]. Further studies and some theories of social network have been conducted and formed, the relationship researches between social network and entrepreneurial activity have also obtained great achievements, among which, social capital theory and network structure theory are representative.

Bourdieu [4] analyzed social capital theory in a relatively systematic and modernistic way, holding that social capital exists in an "institutionalized network", and the network scale, heterogeneity and resource quantity have a great influence on social capital. Granovetter's study about "strong tie" and "weak tie" [5] is a representative research for this theory's usage in entrepreneurship field. In his fundamental research, he emphasized more on the effectiveness of "weak tie", but not all empirical studies supported that view. Bruderl & Preisendorfer (1998) confirmed that "strong tie" is effective in achieving new venture performance [6]. Subsequent researches explained that the "strong tie" contributes to the increase of people's entrepreneurial desire, and the "weak tie" will promote new venture success [7]. On this account, this theory holds that entrepreneurship network provides necessary resources for start-up enterprises, entrepreneurs obtain emotion, information, capital and other supports through various networks in different phases of entrepreneurship.

The network structure theory looks the complex social network relationships as a whole, and each network tie forms a tight structure. Because of different positions and ties, social networks will form different structures. Its use in entrepreneurship research is benefit from the "structure hole" theory put by Burt (1992). Burt's structure hole refers to two parties' no repeat relationship, in his view, the network is instrumental, can transmit information. Social networks with "structure hole" have two benefits: information returns and control profits [8], information returns means information exchange and control benefits refers to third party's intermediary coordination superiority. He thought that entrepreneurs' social networks are the more the better and the not repeated networks are more efficient. He put forward "success does not depend on what you know but who you know", only when competitors have relationship resources with more structure holes, they can get greater benefits.

2.2 Zhejiang Entrepreneurs' Characteristics

The economic growth speed in Zhejiang province is rapid, especially its private economies and entrepreneurial activities are particularly remarkable, and research shows that "Zhejiang entrepreneurial energy is the strongest in the nation and is a

typical entrepreneurship case"(Meng, 2009). Zhejiang entrepreneurial activity is in the new development stage with characteristics of "entrepreneurship drive changes from survival to opportunity, entrepreneurs' quality changes from low to high, entrepreneurship pattern changes from imitation to innovation, entrepreneurship time changes from short-term to sustainable"[2].

In the new stage, entrepreneurs will definitely present new features. Firkin (2001) points out that entrepreneurs' human capital includes general human capital and special human capital [9]; Davidsson & Honig (2003) divided human capital into entrepreneurs' education, entrepreneurship experience, management experience, and entrepreneurial related working experience four dimensions. According to the above studies, this paper studies Zhejiang entrepreneurs' characteristics in entrepreneurs' education background, entrepreneurial experience, management experience, and relevant working experience four dimensions. The data statistics found that in the dimension of education background, 33.8% of the entrepreneurs are bachelors, forming the largest group, which means the entrepreneurs' education background raised in Zhejiang province (the statistic data from Zhejiang Small Enterprise Office showed that the largest group is senior high school degree which takes 46.1% in 2005); on the other hand, 56.9% of the entrepreneurs have no entrepreneurship experience, 71.5% have management experience, 59.2% have worked in the same or related industry before, so we can see that the entrepreneurs of Zhejiang province have high entrepreneurial enthusiasm, and are more likely to begin the entrepreneurship in related industries after they have had management experiences.

2.3 Zhejiang Entrepreneurs' Social Networks' Impacts on New Venture Performance

Most of Zhejiang start-up enterprises are private family enterprises, these family enterprises have more concentrated equities than any other enterprises, this may result in Zhejiang new ventures' differences with other areas' enterprises in shape, size and performance (Xie & Xu, 2007). Entrepreneurial social network studies mainly concentrated on network scale and network strength two dimensions, we will discuss it from the two aspects too.

Network scale is the scope and quantity entrepreneurs contact with others directly (Burt, 1992). Research results showed that social network scale and the time used to preserve and expand the network are significantly correlated with employee growth [20], and that the scale of the network has promoting function to the organization growth [15]. Zhejiang private economy is well developed, from the investigation we can see that most of Zhejiang entrepreneurs have worked in related industries, entrepreneurial social networks are accumulated, entrepreneurs or start-up enterprises in Zhejiang province pay more attention to the development of social networks. Based on the previous analysis, this paper holds that in China's special "guanxi" cultural background, China's new enterprises need extensive social networks to gain necessary resources for higher performance.

Hypothesis 1: network scale has positive impact on new venture performance.

For network strength, it is not only related to the network members' communication time, but also related to the members' emotional close degree and mutual trust degree, it reflects the external resources or information's abundance. The expansion of network scale can increase the extent of resources start-up enterprise can obtain through the network; the network strength can realize the resources achievement through the close network connections between entrepreneurs and resource suppliers, resources obtain can be realized by a low cost through networks with high strength. That is, through the close emotional ties and the increase of trust degree high network strength can increase enterprises' resources obtaining possibility and reduce the access costs. On the basis of resources access convenience and cost reduction, enterprises can obtain a promoted performance through resources obtain and usage.

Hypothesis 2: network strength has positive impact on new venture performance.

3 Empirical Researches

3.1 Samples and Variables

Samples. We select new enterprises established within 8 years in Zhejiang province as samples. The data was collected by questionnaires. Since May 2010 to July 2010, we issued 100 paper questionnaires and 100 web questionnaires within in Zhejiang province, and 130 effective questionnaires in total were obtained. The numbers of new enterprises established with 3 years, 3 to 5 years, 5 to 8 years are roughly match, accounted for 32.3%, 30.8%, and 36.9% separately. For the company sizes, because of the limited establish time, most enterprises have less than 200 employees. The sample enterprises' distributed industries include manufacturing, medicine, transportation, finance, IT, and many other industries. Generally, the distribution of the samples is extensive, and the sample data are representative in Zhejiang province.

Dependent Variable. The dependent variable of this study is new venture performance. Murphy & Callaway (2004) studied a lot of business literatures, and finally got 12 measure indexes. Based on the existing researches, this paper references the new venture performance index system designed by Murphy, evaluates new ventures' development, profit and innovation performance in financial and non-financial two aspects according to the actual conditions of the new enterprises. The nine indicators we used to measure new venture performance are net margin, investment return rate, market share, net earnings growth speed, sales growth speed, new employees increase speed, new product development speed, market share growth speed, and capital turnover rat.

Independent Variables. We measure social network in two aspects: the network scale and network strength.

The social network scale is the scope and quantity of partners and connections in social network (Burt, 1992). Steier & Greenwood (2000) used "the number of

venture capitalists, retailers, sales consultants, and other capital providers associated with entrepreneurs" [21] to measure the scale of network. But in China, under the background of economic transition, entrepreneurs pay more attention to the official network relationship, they apt to communicate and exchange with governments at all levels and industry and commerce administration departments more (Park & Luo, 2001), and this view has got extensive recognition, so this paper measure social network scale by entrepreneurs' interaction extent with friends, industry associations, financial institutions, governments and industry and commerce departments and other departments agencies.

Network strength refers to the frequent and close degree of network contact. Bruderl & Preisendorfer (1998) used "relatives and friends' support degree ", "acquaintances' support degree" and "commercial partners' support degree" three indexes to measure network strength. Premaratne (2002) proposed network strength should be measured in two aspects: one is the connection strength entrepreneurs connected with their families and relatives; another is the connection strength start-up enterprises connected with various organizations. Therefore we synthesize the above points of view, using the close degree new enterprises communicate with friends, industry associations, financial institutions, governments, industry and commerce departments and other institutions to measure the network strength.

3.2 Hypothesis Test and Results

Reliability and Validity Inspection. We use Cronbach alpha coefficient test and factor analysis to test questionnaires' reliability and validity. The Cronbach alpha coefficient test results show that the Cronbach alpha values are all above 0.8 which means that the reliability of questionnaire is good. The KMO and Bartlett sphere test results show that the 10 indexes of network scale's KMO = 0.903, so it is very suitable for the factor analysis; and the Bartlett sphere test result is significantly different from zero, also shows that data is relevant and suitable for the factor analysis. The test results of new venture performance are the same. And the principal component analysis results showed that the questionnaire validity is good.

Variance Analysis. We conducted variance analysis to research sample data's social network and new venture performance difference on factors of entrepreneur education background, enterprise age, enterprise size, industry and other factors. The one way ANOVA analysis results show that all the significant levels are bigger than 0.05, so it is obvious the dependent or independent variables does not exist significant differences in that factors.

Correlation Analysis. Using SPSS16.0 to analysis variables' correlations, and the results show that the Pearson related coefficient between network scale and network strength is 0.689, less than 0.75, there is no phenomenon of independent variables too similar, it is up to the requirements. The independent variables' correlation coefficients with dependent variable showed that the variables are significantly correlated (on the significant level of 0.01). Therefore, the network scale and network strength are all significantly correlated with new venture performance.

Table 1. Correlations

	Network scale	Network strength	New venture performance
Network scale	1		
Network strength	0.689**	1	
New venture performance	0.629**	0.606**	1

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis. To research the further dependency relationship, we conducted regression analysis. Using stepwise regression method to study the independent variables and dependent variable's relationship, the results showed in table 2 that the variables indeed have linear relation and the effect is remarkable. The network scale and new venture performance's regression equation can pass the significant inspection ($P < 0.001$), so hypothesis 1 is proven; network strength and new venture performance are also positively related, and can pass the significant inspection, hypothesis 2 is proven. Therefore, network scale has significant impact on new venture performance and network strength also plays a significantly positive role in new venture performance gaining.

Table 2. Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.863	0.277		6.727	0.000
	Network scale	0.566	0.062	0.629	9.164	0.000
2	(Constant)	1.558	0.278		5.606	0.000
	Network scale	0.363	0.081	0.404	4.458	0.000
	Network strength	0.278	0.077	0.328	3.621	0.000

[a] Dependent Variable: new venture performance.

3.3 Discussion

The sample statistic results show that Zhejiang entrepreneurs had new features in education background, entrepreneurship experience, management experience, related working experience etc. What changed most is entrepreneurs' pre-entrepreneurship education background; its ascension reflected the high-level talents' notion transformation of employment and entrepreneurship. This can be concluded that the high-level talents play a more important role in entrepreneurship activities is an inevitable trend. And the results of variance analysis suggest that social networks are equally important for different educated entrepreneurs and for new ventures in different development stages and different scales. No matter

the entrepreneurs or new enterprises should value the effects of entrepreneurial social network.

Regression analysis verified the proposed two assumptions, and the results show that the bigger the social network scale is, the stronger the network strength is, the more resources new enterprises will get from the network, the more beneficial to the survival and development of enterprises. In Zhejiang province, such a thriving entrepreneurial region and social network's size means the breadth to obtain resources and opportunities, and the strength of the network means the possibilities of getting them. So emphasizing network creation and maintenance will be helpful to new venture survival and development, and this may also be one of the reasons why the entrepreneurial success rate in Zhejiang area is in forefront of the nation. Zhejiang area's entrepreneurship experience should be referenced by other regions.

4 Conclusions

Previous entrepreneurship researches are lack of ones based on certain region characteristics, and our studies find that the characteristics of entrepreneur groups will actually change with the change of environment, so later studies should be conducted on the basis of the difference of entrepreneur groups' characteristics. The empirical study showed that social network's effects on new venture performance are significant, that is, the bigger entrepreneurial network scale is and the stronger its strength is, the better new venture performance will be. Therefore, for the new enterprises, social networks' construction and relationship maintenance should be strengthened consciously; and for the government, the guiding policies should be formulated and implicated for new ventures to get a better environment and to promote enterprises' network construction and entrepreneurial activities' prosperity.

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Cluster Analysis of Regional Economic Development in Hebei Province

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Abstract. In order to evaluate the development level of cities in Hebei province, the author selects 10 statistical indicators, and uses the factor analysis and cluster analysis methods in SPSS to analysis the data. Since 1980, each city adjusted the industrial structure, and achieved some success. However, in practice, the proportion of secondary industry in most areas has changed little. After analysis the author divides the cities into four grades and then sums up the features of regional economic of Hebei Province.

Keywords: Cluster analysis, Regional economic development, SPSS.

1 Establishing Economic Development Indicator System

The economic development level of one region reflects not only all aspects of national economic development in a certain period but also reflects the region's sustained development possibilities. Therefore, the indicator system to measure the level of regional economic development is very important. The evaluation should not only reflect the region's existing economic strengths, but also reflect the economic development prospects. Based on scientific, practical and feasible, comparability, quantifiable principles, 10 economic indicators are selected to comprehensively and objectively reflect the cities' level of economic development [1]. X_1: GDP; X_2: value-added of industrial; X_3: local fiscal expenditure ;X_4: value-added of the secondary industry ; X_5: value-added of the third industry; X_6: actual utilization of foreign capital; X_7: Total retail sales of social consumer goods; X_8:annual per capita consumption expenditure of urban households; X_9: deposits of financial institutions at year-end; X_{10}: loans of financial institutions at year-end. All the indicators come from "Statistical Yearbook of Hebei Province in 2010,"[2] before we analysis the data we standardize the data to eliminate the raw data of a different dimension impact.

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2 Empirical Analysis

2.1 Factor Analysis

The basic idea of the factor analysis is based on the size of the number of relevant variables into a few measured not related to the comprehensive index of multivariate statistical analysis[3]. By factor analysis, you can use less irrelevant composite indicator to describe each component of the original observation indicators, the information in as little as possible in case of loss, reducing the complexity of the problem analysis of the statistical analysis.

KMO and Bartlett's Test. The author uses SPSS16.0 to analysis the data with KMO and Bartlett's Test, the results shows that the KMO=0.823>0.8 which indicates that the data is appropriate. When the result of KMO is below 0.5, we should choose another set of data instead. The sig<0.01 shows that the variables are significantly associated.

Principal component extraction. This paper uses eigenvalue criteria and the cumulative variance contribution rate of factor combination method to determine the number of extracted principal components, which select the eigenvalue greater than or equal to 1 as the initial principal component factor, while the number of factors contribute to meet the cumulative variance rate of 80%. Calculated by SPSS16.0(table 1), we seek the eigenvalues of the first factor of 7.284> 1, the first two factors' cumulative variance contribution rate is 84.025%> 80%, which can explain the original variables, so the first two factors are appropriate, have obvious practical significance.

Table 1. Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.284	72.841	72.841	7.284	72.841	72.841	5.736	57.363	57.363
2	1.118	11.184	84.025	1.118	11.184	84.025	2.666	26.662	84.025
3	.975	9.747	93.772						
4	.289	2.889	96.661						
5	.226	2.257	98.918						
6	.056	.565	99.483						
7	.045	.448	99.931						
8	.006	.064	99.995						
9	.000	.004	99.998						
10	.000	.002	100.000						

Because the main ingredients of the original linear combination of the index, the principal component scores based on the information table provided by the principal component score coefficient as the original of each index factor. Then the expression of the main component Fi scores are:

$$F_1 = 0.111\ X_1 - 0.158\ X_2 + 0.137\ X_3 + 0.181\ X_4 + 0.193\ X_5 + 0.019\ X_6 + 0.232\ X_7 - 0.256\ X_8 + 0.188\ X_9 + 0.215\ X_{10} \quad (1)$$

$$F_2 = 0.079\ X_1 + 0.477\ X_2 + 0.023\ X_3 - 0.058\ X_4 - 0.123\ X_5 + 0.197\ X_6 - 0.141\ X_7 + 0.604\ X_8 - 0.084\ X_9 - 0.145\ X_{10} \quad (2)$$

Table 2. Component score coefficient matrix

	Component 1	Component 2
X1	.111	.079
X2	-.158	.477
X3	.137	.023
X4	.181	-.058
X5	.193	-.123
X6	.019	.197
X7	.232	-.141
X8	-.256	.604
X9	.188	-.084
X10	.215	-.145

In order to analyze the overall strength of the region, two common factors can be the weighted sum of the scores. Weights on whichever is the variance value or the variance contribution rate(see in table 1). According to the result above, the general factor score is:

$$zF = 57.36\% \cdot F_1 + 26.66\% \cdot F_2 \quad (3)$$

Bring the data into the formula F_1 ,F_2 and zF to caculate and got the result (table 3)

Table 3. General factor score of 11 cities in Hebei Province

	F_1	F_2	zF
Shijiazhuang	2.27503	-0.64573	1.13
Chengde	-0.71317	-0.41524	-0.52
Zhangjiakou	-0.57364	-0.44312	-0.45
Qinhuangdao	-0.99999	0.59511	-0.41
Tangshan	0.80881	2.66114	1.17
Langfang	-0.80577	0.71553	-0.27
Baoding	0.48264	-0.39417	0.17
Cangzhou	0.27707	-0.62435	-0.01
Hengshui	-0.87697	-0.52842	-0.64
Xingtai	-0.48308	-0.365	-0.37
Handan	0.60908	-0.55575	0.2

2.2 K-Means Cluster

By using K-Means cluster analysis, the 11 cities are devided into four categories (table4).

Table 4. Cluster Membership

Case Number	Cities	Cluster	Distance
1	Shijiazhuang	1	.000
2	Chengde	4	208.006
3	Zhangjiakou	4	201.821
4	Qinhuangdao	4	466.554
5	Tangshan	3	.000
6	Langfang	4	366.753
7	Baoding	2	221.858
8	Cangzhou	2	372.842
9	Hengshui	4	409.208
10	Xingtai	4	268.826
11	Handan	2	363.247

The results show in table 3 and table 4 keep the same structure, it indicates that the methods we used are correct and the results are convincing[4].

3 Analysis of Empirical Results

3.1 Cluster Analysis

According to the analyses above, the cities are devided into four categories. There is only one city Shijiazhuang in the first cluster. As can be seen from table 3, Shijiazhuang's score of F_1 is higher than that of Tangshan, it indicates that Shijiazhuang's GDP ranked the first in Hebei Province, but Shijiazhuang's industrial added value is much lower then Tangshan. However, it is normal for Shijiazhuang is the provincial capital of Hebei Province, it has all aspects of the advantages and favorable conditions, so its overall ranking is in the first place. Currently the pace of development of Shijiazhuang and Tangshan, has been far down the other nine cities.

The second cluster includes three cities: Baoding, Cangzhou and Handan. The score of F_1 in these three cities are all positive numbers, but F_1 are negative numbers, which indicates that the industrial added value of these three cities is not high, these three cities are not industrial cities, but the other industries in these cities develop well. It should be mentioned that Cangzhou is new in the second cluster for its rapid development in recent years.

The third cluster includes only one city:Tangshan. The third does not mean weaker than the second. Seen from table 3, the general factor score of Tangshan is in the first place. The industrial added value is much higer than the others, it is because Tangshan Is a century-old coastal city of heavy industry, there is a National Industrial Zone which called Caofeidian Industrial Zone in Tangshan. In addition, its location also plays an important role in promoting Tangshan city's economic development.

The fourth cluster includes six cities: Chengde, Zhangjiakou, Langfang, Qinhuangdao, Hengshui, and Xingtai. The score of F_1 in these cities are all negative numbers, it indicates that these cities have no advantage on the revenue side. In fact, the size of these cities is relatively small compared to the previous three, and their development does not scale, but they are very potential.

3.2 Features

According to the results of cluster analysis, the county's economic development in Hebei Province shows the following distinctive features.

Shijiazhuang, Tangshan become two poles. Shijiazhuang and Tangshan cities stand in the forefront of the province's economic construction with policies, resources over the years. In addition to individual cities in the individual indicators in recent side impact at the forefront of the trend, but has advantages of the port of Qinhuangdao and Cangzhou, near the port and capital that is Hengshui, near Beijing and Tianjin which is Baoding, these cities have the potential to become a provincial economic development focua area, but overall still no clear signs of a breakthrough, and with a strong regional disparities continue to widen focus aera.

Large collaborative economic regions were not yet been born. Many economists generally believe that Hebei has now established five special economic zone

of the leading position of the outcome over the years, that is, eastern Hebei economic zone, including Tangshan, Qinhuangdao; around Beijing and Tianjin Economic Zone, including Baoding, Langfang; Zhang-Cheng economic zone, including Zhangjiakou, Chengde; middle Hebei economic zone, including Shijiazhuang, Cangzhou, Hengshui; southern Hebei economic zone, including Handan, Xingtai. They study from the province's GDP accounted for, the convergence of industry characteristics, the regional growth poles within the geographical location of the natural point of view of all economic regions, but the key question is not formed appropriate scale.

4 Conclusion

This paper shows that the economic development of dependence on resources is too obvious in Hebei province, it is not conducive to rational allocation of resources and circulation, and lead to serious waste of resources, thus making regional economic efficiency is always fluctuating.

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Research on Construction of University Students' Self-regulated Learning Environmental Based on Internet

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Abstract. Self-regulated learning capability is important for university students' development. Online learning plat is an important learning environment as well as the traditional class. This paper explores the logic and the tactics to construct university students' online self-regulated learning environment from perspectives of physical factor, social factor and cultural factor based on the theory of open learning.

Keywords: self-regulated learning, online, physical factor, social factor, cultural factor.

1 Introduction

Self-regulated learning, defined as learning process in which a learner attends with cognition, motivation, and positive attitude, is an important branch in the domain of university students' education (Zimmerman, 1989). A self-regulated learner often acts with specific target, learning tactics, systematic studying methods, self-regulated and persistence spirits. Students with good performance are always associated with self-regulated ability, and methods that are designed for self-regulated learning have effects on students' learning performance as well (Biemiller, etc, 1993). In self-regulated learning processes, learning targets are firstly established, then self-cognition and motivation are accommodated as well as behaviors; Self-regulated learning processes start from and are restricted by learning targets and environment.

Social Cognitive School takes individual, environment and behavior as the three effluence factors of self-regulated learning. Environment is widely accepted by scholars. Environment can effluence students' learning attitude, help build self-regulated learning practice and improve self-regulated learning ability.

Internet gives a platform for self-learning. It is essential to conduct research on how to improve students' ability to acquire knowledge through internet. In this study, students' self-regulated learning environmental based on internet is treated as an interactive community in which students can register, submit topics, share experience and raise questions. Teachers can release learning targets, contents and norms of the secondary practice class through the community, share supplementary learning resources and answer students' questions.

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2 Social Learning and Self-regulated Learning Environment

Badrul, expert in remote education, defined the future study as open, flexible and scattered. In recent years, newly developed information applications, such as blog, wiki, online community, appear as the open learning channels. Blog is a tool for information transmitting, which starts the era of web2.0. However, university students' being keen on blogs are temporary, and the vulgarity and superficiality are threatening the development of blogs (Zhu, Feng, Zhang, Liu, 2008).

Wiki developed the function of editing certain information by a variety of users. It enables users to share and compile a mutual work, and then develops a knowledge pool sorted by key words, which gives great maintenance to studying resource collecting and technology development. Yuan (2010) proposed the dual education models, model of knowledge construction and model of interaction within community, based on the sharing and bilateral-editing functions of Wiki. Zhang (2008) researched on the application of Wiki in English composing studies, the openness and collaboration features of Wiki compensate the deficiency of reading, feeding back, and modifying in typical English teaching. The combination of Wiki and English education can improve cooperation of English reading, writing and modifying.

Online community is a platform defined as a place for a gathering of people who are sharing the same interests in internet. Hu and Lu(2009) pointed out that the factors of environment, knowledge and impetus influence the intendancy of students' knowledge sharing. Online community relies on the three factors for knowledge sharing.

Based on literature analysis, internet applications can help establish open resource learning mode, making knowledge gathering of university students transmit from typical education to outer resources.

3 Tactics of Initiating Self-regulated Learning Environment Based on Internet

Classes are where knowledge exchange proceeds. A traditional class consists of physical factors such as subjects, courses and learning targets, social factors such as the relationship between teachers and students, and cultural factors such as education ideology, social criterions and expects (Turner, 2001). In this article, self-regulated learning environment based on internet inherit the three factors from the typical classes. Moreover, regime factor is embedded in cultural factors.

3.1 Building Online Learning Environment Based on Physical Factors

The self-regulated learning environment based on internet is a platform that a group of students could participate in to share and learn, in which the students share the mutual learning subjects and targets. Compared with the traditional classes, online

studying emphasizes the participation of students, communications between students and teachers, and development of self-regulated learning abilities.

Online learning platform ensure the participants base firstly, then give learning subjects, targets and tasks. Through platform publicity and forum settings, self-regulated learning environment could cater to the needs of the participants. Flexibility is the advantage of online learning platform. Students need to stick to the same place as well as the same time in traditional classes. However, online learning platform allows knowledge exchange happens at different places and different time. Online learning platform emphasizes on students' participation and domination, which turn the negative learning style into positive style. Online learning platform has a wide range of learning materials, which possess the merits of sufficiency, easy-searching, easy-approaching. Online learning platform also proceeds with continuity, ensures time-free participating of the students.

Online learning platform also has its limitation when referring to students' continuous participating and systematic learning process. Moreover, online learning platform lacks students' face-to-face communication. Systematic studying can't be separated from traditional classes, while the skill-teaching and problem-solving could based on online learning platform; Collaboration of traditional and online learning platform are to be encouraged.

3.2 Building Online Learning Environment Based on Social Factors

In online learning platform, social factors consist of participants' communication and interaction, including communication among students, interaction between teachers and students.

A. Interactions between teachers and students. Students can raise questions like learning tasks, learning methods and so on. Teachers give students clues on how to solve questions, and offer students with guidance of "know-what, know-how, know-why and know where". "Know-where" is the place to find specific knowledge, and is a key element which teachers offer students with to direct problem-solving which includes specialized website, search engine, community and so on. Students are more tending to learn by themselves after grasping self-regulated learning methods.

B. Communication among students. Students can consult other students online when facing problems, then can share experience, works and achievements online, and recommend learning resources to other students. Student can build their own blogs and twitters, publishing their works, giving problem-solving methods. Online learning plat can help students manage their own knowledge efficiently. Through tags, students can deal with their knowledge management as well as knowledge sharing better. Students can get "favorite" function, which help students collect community website, experts' blogs, so that valuable knowledge could be approached easily.

3.3 Building Online Learning Environment Based on Culture Factors

Mechanism is to be set up in online learning platform in order to stimulate knowledge and experience sharing and to form online learning culture and self-regulated learning environment.

A. Mechanism building for online sharing. Scores are to be distributed to students according to whose article publication. More articles means high scores, and students with high scores are to be awarded with participation prize; Articles with high quality praised by other community participants are to be offered with contributing scores. Students with high contributing scores are awarded the contributing prize.

B. Culture building for online sharing. Motivation of students' sharing knowledge and experience derive from three aspects: mutual beneficial mechanism, self-realization and "show" attitude of the Communitarians, altruism spirit. On online learning platform, the three aspects should also be encouraged. Therefore, relevant rules are to be set up, and culture is to be formed, so that knowledge sharing and knowledge creating are stimulated in online learning platform, which encourage students to share learning resources, experience and practices. Awards and praises are to be offered to the students who give their comments on the articles, so that more students could give praise to whoever offer good articles and comments.

C. Culture building for self-regulated learning. The environment in which students are encouraged to solve problems by themselves should be developed. Community manual should point out that students should think by themselves after meeting with problems, and then search relevant resources and get problems solved. If the problems are beyond the students' ability, students can refer to teachers and other students in online community. Volunteers are selected from online community members, who will take charge of the online learning platform. Students with high problem-solving performance and high score are to be awarded and praised in online learning platform.

4 Conclusion

In general, online learning environment based on internet compensate for the disadvantage of traditional classes because the former encourages participation, communication and self-regulated attitude of students, which help students form the habit of self-regulated learning. online learning environment construction should focus on the building of physical factors, social factors and cultural mechanism.

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Research on Contracting Risk Control in Building Engineering

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Abstract. As early as in 25 years ago, the concept of the engineering contracting has been introduced in China, and triggered a construction project in the area of revolution. It comes a new trend, that is clients ask contracting enterprise to comprehensive service, more and more owners hope to contracting enterprise provide project construction contract. This method can reduce the workload of the contract management, it is good for comprehensive coordinating relations and the contradiction. Project Strengthening unified command, it strength project schedule, construction funds, equipment supply, completion acceptance for the supervision and control plan, shorten the construction period and ensure the quality of the construction. But, to the contractor, this way for some reason there is some risk.

Keywords: Engineering contracting, Risk management, Risk control, Incentive system.

1 Building Engineering Contracting Overview

With the quick domestic and international market integration degree, engineering construction market is undergoing profound changes. Engineering construction and management increasingly to specialization. The owner have the high requirements to project investment, construction period, technology and level quality. Engineering construction project was established by the owners on the traditional pattern of management has been difficult to satisfy the needs of the professional management. And engineering contracting go with the trend of the development of the market and the owner's objective requirement.

2 Risks in Building Engineering Contracting

2.1 The Risk Faced by the Contractor

Engineering construction have the simplicity, time limit and complex technology, every aspect in it contains risk factors. Engineering contractor is the main parties,

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facing the caused of engineering or related to the risk, how to guard against the risk for the contractor to finish on time and guaranteed quality is very important. Construction project contractors faces many risks. As Fig. 1:

Decision-making risk	The contracting and execution risk	Liability risk
Information choices risk	Contract management	Professional liability
Information distortion risk	Engineering management	Legal responsibility
Intermediary risk	Material management	Alternative responsibility
Agency risk	Financial management	Personnel responsibility
Owners buy bid risk		
Joint the bid risk		
Fault offer risk		

Fig. 1.

2.2 Building Engineering Contracting Project Parties Risk

Project participants in addition to the contractor themselves, including project owner, supervision engineer, and part of the subcontractor and material equipment suppliers. To contractor, risk comes from construction enterprise management and project management level; from the payment bond and engineers' attitude and level; the degree and the subcontractors' ability is important risk factors; The cost and quality of supply delivery is also the source of the risk.

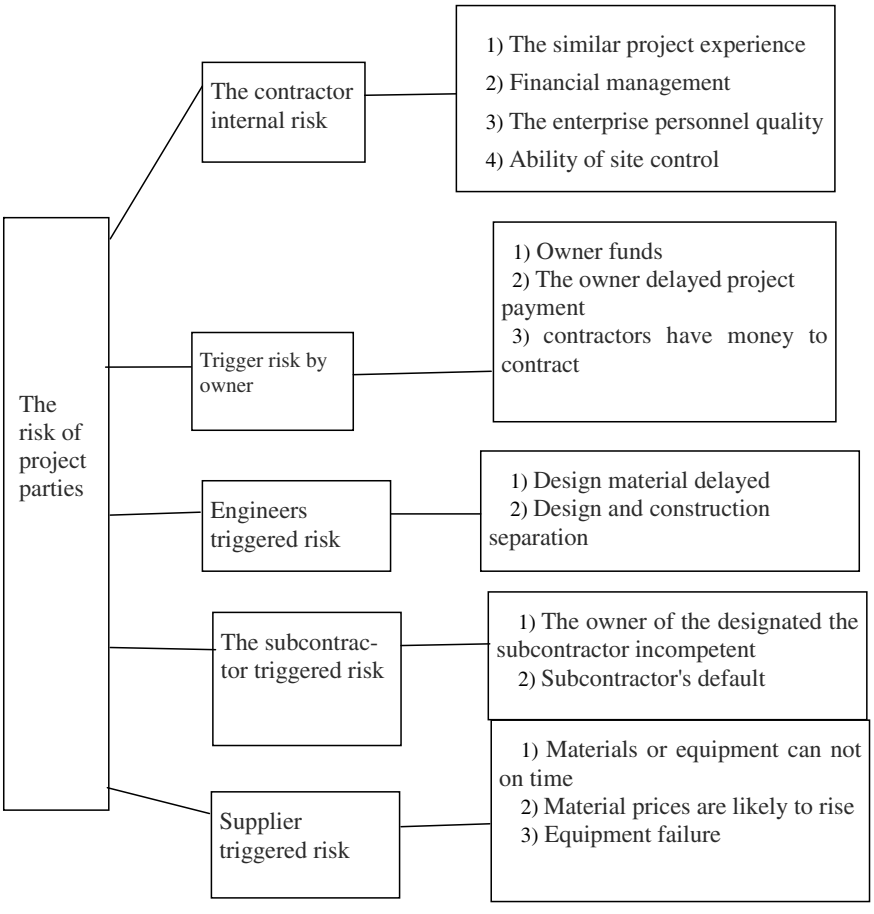

Fig. 2. Project parties risk

3 Building Engineering Contracting Risk Control

The research of reason of risk service risk control. The risk controling affect organizational realizing the goal of the various uncertainties events, and then to distinguish and estimate, and take measures to control the influence within the acceptable limits of the process. When risk occurs, it is not influence the normal business enterprise operation. Well risk control can help to reduce the chance of wrong decision, avoid the possibility of loss, improve the enterprise itself value added. Therefore, the construction of the general contractor enterprise should through the risk analysis can control risk effectively, which can reduce risk.

3.1 Building Engineering Contracting Risk Control Principle

After identification, analysis, estimation and evaluation in the engineering project general contracting risk, risk management personnel according to the engineering project risk properties and potential effects, and with the project master as the object plan and choose rational risk management strategies, should as far as possible to reduce the potential losses and improve the project risk control ability of the project. The aim of the risk treatment countermeasures: Reduce the engineering project risk potential losses; improve the ability of the project risks control. But the main countermeasures risk treatment is risk control.

3.1.1 Risk Avoidance

Risk factors is the necessary conditions for the project risks, risk avoidance countermeasures is by avoiding risk factors, to avoid possible potential loss or uncertainty. This is a common method of the risk treatment. Risk avoidance countermeasures has the following features: 1)It may be impossible to avoid the risk, the wider the the definition of the project, the less possible to avoid; 2)Avoidance lost benefit from it;3)Avoid a project risk may produce new one. Risk avoidance countermeasures often as a provisions, such as prohibited the use of harmful to human body building materials, etc. Therefore, in order to implement risk avoidance countermeasures after risk management personnel in determining the produce of the project risk all activities, may make some prohibitive rules.

3.1.2 Risk Loss Control

Loss control method is to reduce the loss occurred, or by reducing the chance of what happened the seriousness of the loss to deal with the project risk. As the same as risk avoidance, the loss of control as the object and not set up a fund to deal with. But avoidance prefer to a negative give up and suspended. According to its purpose, Damage control measures can be divided into:1) Loss prevention, safety plans, etc. 2) Loss means, and divide to minimize the loss, disaster plan and loss scheme save scheme, the emergency plan. Loss prevention means aims to reduce or eliminate the possibility of loss occur, loss methods, trying to reduce the loss of potential seriousness. Loss control scheme is a loss prevention means and loss means combination. Safety plan, disaster plan and the emergency plan is risk control plan of the key component. The purpose of the security plan is targeted to prevent loss happened, disaster program is providing people with dealing with various kinds of emergency procedures, and the emergency plan made after the accident, how to deal with minimum cost of construction or operation is back to normal.

3.2 Characteristic of Building Engineering Contracting Risk Control

Many of construction enterprise as a contractor to the risk control is in preliminary and rely on the accumulation of experience stage, the method is easy to operate, it

lack of standard, the effective scientific management procedures, and then resist risk weak ability. So, the contractor of construction engineering contracting of the risk in the analysis of the problems and control is not good enough. Therefore, the construction project contract risk control has three characteristics.

3.3 Measures of Building Engineering Contracting Risk Control

In order to effectively control the risk of construction engineering general contractor, first should choose security risk control measures, and then establish a flexible and pragmatic enterprise management system, a risk department and risk managers as the main body of the supervision mechanism, clear risk liability subject. According to the principle of risk allocation, strengthen the control target, distribution of risk reasonable, and show people first, formulate relevant incentive system, finally efforts should be made to accumulate experience, as soon as possible to establish the risk prevention system. Thus, in the environment of increasing competition to survive development, and remain invincible.

4 Conclusion

In addition to the above aspects, the contractor should also actively seeking a new way of risk avoidance, Use international effective risk avoidance and management methods, in order to reduce the operation cost. Therefore, the contractor of construction engineering contracting of risk control, it should take the enterprise system innovation as the foundation, through the establishment of risk management departments, risk manager and risk protection fund, and also establish corresponding phase of the dynamic prospective decision-making system, to target management as the main form, and control each construction process, the potential risk factors and relevant details on scientific management, in order to reduce risk, improve the losing of profitability and capital efficiency. So, the contractor to fierce competition in the market to ensure the future brightly, whether the boom or recession, it always maintain enterprise vitality.

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Model of Biding Evaluation Based on Algorithm of Adjusting Weight of Decision-Makers

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Abstract. In the mark process, considering the professor's proportion and the proportion of the index of evaluation, this method calculates the professor's adjustive weights by the difference between the decision results of the individual and the group and combining with the theory of entropy, and gets the index's adjustive weights by entropy coefficient theories. The new individual and group evaluation results can be calculated under the new weight, and as further adjusted for weights. Finally the above process will be repeated until get a steadily weight and mark results, and makes the mark process more reasonable and more scientific.

Keywords: mark, weight-adjusting, entropy weight, group decision-making, weights of decision-makers.

1 Introduction

With the steady regulation and improvement of building market, it is a trend to establish a suit of scientific and rational bid evaluation standards and methods. At present, methods for weight determination are divided into both subjective weight determination and objective weight determination. Based on the definition of entropy by Shannon, the Entropy of the index of evaluation is defined by the judge-array which is made of the index value of all cases, and the Entropy of the index value is used to define the entropy proportion. Finally, the best case is selected by lines up the case by closing degree of all cases and the ideal dot [1]. Study applies multi-objective decision on bid evaluation, builds the right bid evaluation model, carries on the comprehensive decision, synthesizes the norms and gained a result [2]. Because the bid assessment committee is composed of experts who come from different speciality and the accuracy and completeness evaluation information is limited by expert knowledge, cognitive ability, experience and preference, it is very difficult to remove the human element. Then it is inappropriate to simply regard expects' weights as an equal. For this case, Ma (2000) applied the combination of group eigenvalue method and multi-at-tribute complex entropy to bidding evaluation process and two applied methods are obtained by different evaluation ways [3]. Zhou (2006) consider the expert weight is composed of

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prior-weight and posterior-weight and establishes an evaluation index system to find out the prior-weight, and proposes a method to decide the posterior weight when fuzzy judgment matrices are used to evaluate the expert[4].

Considering the expert weights and index weights, this paper adjusts subjective weight by calculating the deviation and entropy weight, and then a new tender evaluation result is draw adjusted weights. Based on the contrast of the original and the new results, the outcome is tending towards stability [5]. If it's instability, you must continue your adjustment till it is stability.

2 Multi-attribute Decision Making in Bid Evaluation

The evaluating process is a systematic process of multiple-objective decision-making, which is to sort and select limited schemes having many attributes in accordance with some decision criterion or measure [6]. The tenderee set up according to law the bid assessment committee in charge of the activities of the bid evaluation before evaluation of bid. The bid assessment committee is composed of tenderee or representative from tender proxy organization and experts in technology and economy. The member of the committee is odd number over five and the number of experts in technology and economy accounts for over two-thirds of the total. Because specialists have different professions, decision-making ability and preferences to attributes of bidding scheme, decision making in evaluating the bid is a multi-attribute decision-making process.

2.1 Building Multiple-Attribute Group Decision-Making Model in Bid Evaluation

Multiple-Attribute Group Decision-Making is a systematic process. In order to illustrate better, here suppose that s is the number of expert of the bid assessment committee, m is the number of the bidding scheme, n is the number of the index, and the set of expert is $D = \{d_1, d_2, \cdots, d_s\}$, the set of scheme is $C = \{C_1, C_2, \cdots, C_m\}$, the set of attribute is $F = \{f_1, f_2, \cdots, f_n\}$. The specialist grade is denoted as a_{ij}^k, that is expert (d_k)mark the attribute (j) of bid precept (C_i), then grade matrix is denoted as

$$A_k = \left(a_{ij}^k\right)_{m\times n} \tag{1}$$

Where, $k = 1,2,\cdots, si = 1,2,\cdots, mj = 1,2,\cdots, n$. The weight (λ_k) of expert (d_k) is defined by the methods to subjectively determine the weight. Where, $0 \le \omega_j \le 1, \sum_{j=1}^{n} \omega_j = 1, j = 1,2,\cdots, n$. The weight of attribute is ω_j. Where, $0 \le \omega_j \le 1, \sum_{j=1}^{n} \omega_j = 1, j = 1,2,\cdots, n$.

2.2 Standardization in Specialist Grade

In order to have a good analysis, the weight of attribute must be handled dimensionlessly. Specialist grades are generally divided into three types: cost type, benefit type and fixed type. According to different types, different methods on standardization are defined as:

$$\begin{cases} r_{ij} = \left(maxx_{ij} - x_{ij}\right)/\left(maxx_{ij} - minx_{ij}\right) \\ r_{ij} = \left(x_{ij} - minx_{ij}\right)/\left(maxx_{ij} - minx_{ij}\right) \\ r_{ij} = 1 - \left|x_{ij} - r_i\right|/max\left|x_{ij} - r\right| \end{cases} \tag{2}$$

Where, ①Cost type: the smaller attribute value is, the better; ②Benefit type: the larger attribute value is, the better; ③Fixed type: the closer to a specified value attribute value is, the better [7]. Standardized matrix is $R^k = \left(r_{ij}^k\right)_{m\times n}$.

2.3 Making Policy for Bid

Every expert evaluation result is the sum of the weighted expert marks, that is $Y_k = (y_{k1}, y_{k2}, \cdots, y_{km})^T$. It follows a formula like this:

$$y_{ki} = \sum_{j=1}^{n} r_{ij}^k \omega_j \tag{3}$$

Then, the decision matrix is consisting of all individual decision results, that is $B = [b_{ik}]_{m\times s}$, where, $b_{ik} = y_{ki}$.

The index weighted evaluating matrix ($G = \left(g_{ij}\right)_{m\times n}$) is obtained by the sum of the weighted experts' grades. Where,

$$g_{ij} = \sum_{k=1}^{s} a_{ij}^k \lambda_k \tag{4}$$

Then,

$$G = \begin{bmatrix} g_{11} & \cdots & g_{1n} \\ \vdots & \ddots & \vdots \\ g_{m1} & \cdots & g_{mn} \end{bmatrix}$$

According to the way to standardizing, the matrix can be converted into$G' =$ to$G' = \left(g'_{ij}\right)_{m\times n}$.

Let the group decision result is $X = (x_1, x_2, \cdots, x_m)^T$. It follows a formula like this:

$$x_i = \sum_{k=1}^{s} g'_{ij} \omega_j \tag{5}$$

2.4 Determining the Weight of Every Expert

As a basic concept in systematology originating from thermodynamics, entropy was introduced in information science by Shannon, and then entropy theory was put into use on a wide scale [8]. According to the concept of probability metric entropy, the entropy can be determined as follows:

$$H = -k\sum_{i} P_i \log P_i \tag{6}$$

Where, k is proportional coefficient, depending on how to choose physical quantity unit. If logarithm based on10, k=1. Based on the definition of entropy, when $P_i = \frac{1}{n}$, entropy(H) is maximum, $H(p_1, p_2, \cdots, p_n) \le H\left(\frac{1}{n}, \frac{1}{n}, \cdots, \frac{1}{n}\right) = \log n$. The uniformity of distribution is better, H is closer to H_{max}, the entropy value is bigger.

Expert entropy is defined as:

$$H_k = -\left(\sum_{i=1}^{m} f_{ik} \ln f_{ik}\right)/\ln m \tag{7}$$

Where,$f_{ik} = b_{ik}/\sum_{i=1}^{m} b_{ik}$, if $f_{ik} = 0$, $f_{ik} \ln f_{ik} = 0$, but if $f_{ik} = 1, \ln f_{ik} = 0$, this against the goal of entropy. So f_{ik} must be corrected, i.e.

$$f_{ik} = \frac{1 + b_{ik}}{\sum_{i=1}^{m} 1 + b_{ik}} \tag{8}$$

The basic idea of entropy describes system uncertainty. For the macroscopic state of system, it contains the more microscopic states, entropy of system is bigger, and the measure of disorder is greater, or the measure of disorder is smaller. Understandably, the closer the every tender evaluation result is, the bigger the entropy value is, the smaller entropy weight is. Here, entropy weight is not the practical importance coefficient of one expert, but the relative vehemence coefficient in the competitive sense after all bidding schemes is determined. This has the same meaning for attribute weight which will be discussed below.

The expert weight is standardized, i.e.

$$h_k = \frac{1 - H_k}{s - \sum_{k=1}^{s} H_k} \tag{9}$$

Where, $0 \le h_k \le 1, k = 1,2,\cdots,s;\ \sum_{k=1}^{s} h_k = 1$.

2.5 Determining and Adjusting the Expert Departing Weight

From above, each expert evaluation vector of bid is described as $Y_k = (y_{k1}, y_{k2}, \cdots, y_{km})^T$ and experts' evaluation vector of bid is described as $X = (x_1, x_2, \cdots, x_m)^T$. Under the difference between them, their deviating vector can be

formulated as follows: $Z_k = (z_{k1}, z_{k2}, \cdots, z_{km})^T$, where $z_{ki} = |y_{ki} - x_I|, k = 1,2, \cdots, s;\ i = 1,2, \cdots, m$. The general deviating vector can be formulated as follows: $\Delta_k = \sum_{i=1}^{m}(y_{ki} - x_i)^2$.

Group decision is result of collective wisdom. It is obvious that the deviation is zero, that's mean individual evaluation result and group evaluation result are reaching unanimity. The expert weight decreases with deviating degree increases. So expert deviating weight can be formulated as follows:

$$q_k = \frac{\frac{1}{\Delta_k}}{\sum_{k=1}^{s}\frac{1}{\Delta_k}} = \frac{1}{\Delta_k \sum_{k=1}^{s}\frac{1}{\Delta_k}} \tag{10}$$

In this way, it's easily to seek the inconsistency and to neglect part experts' evaluation results. That will make the tender evaluation result unfair and unscientific. The integrated expert weight is obtained by adjustment. The adjustable value of expert weight can be formulated as follows:

$$\lambda_k' = tq_k + (1-t)h_k \tag{11}$$

Where, $0 \le t \le 1$, let t=0.6. According to the different situation, the different value of t is set. So we can get new expert weight[9].

2.6 Adjusting Attribute Weight

According to calculative process of expert entropy weight, attribute entropy weight can be determined as follows:

$$\Phi_j = -\left(\sum_{i=1}^{m}\frac{1+g_{ij}'}{\sum_{i=1}^{m}1+g_{ij}'}\ln\frac{1+g_{ij}'}{\sum_{i=1}^{m}1+g_{ij}'}\right)/\ln m \quad j = 12\cdots n \tag{12}$$

The new attribute entropy weight is obtained by the normalizing method. So,

$$\omega_j' = \frac{1-\Phi_j}{n-\sum_{j=1}^{n}\Phi_j} \tag{13}$$

Where, $0 \le \omega_j' \le 1 \sum_{j=1}^{n}\omega_j' j = 12\cdots n$.

2.7 Calculating the Difference Distance

A new group evaluation result can be formulated under new expert weight as follows: $X' = (x_1' x_2' \cdots x_m')^T$. Expression to compute the difference distance can be determined as follows:

$$\Gamma = \sqrt{\sum_{i=1}^{m}(x_i' - x_i)^2} \tag{14}$$

Let distance threshold is γ. If $\Gamma \leq \gamma$, two computations are reaching unanimity, then adjustment is concluded. The final tender evaluation result is X'. Conversely, let $X = X'\lambda_k = \lambda_k'\omega_j = \omega_j'$, the weight adjustment adaptive will continue[10].

2.8 Algorithm Procedures

As stated previously, the method of expert weight adjustment was designed as follows:

Step1: calculating the subjective weight of expert and attribute ($\lambda_k$andω_j) by subjective methods.

Step2: normalizing mark matrix of bid precepts ($R_k = \left(r_{ij}^k\right)_{m\times n}$) by equation (2), and getting the matrix $R_k = \left(r_{ij}^k\right)_{m\times n}$.

Step3: calculating expert individual and group evaluation results ($Y_k$and$X$) by equation (3) (4) (5).

Step4: calculating expert entropy weight h_k and deviating weight $q_k$by equation (9) (10), and calculating the expert adjustable weight (λ_k').

Step5: determining new weighted mark matrix (G) based on new expert weight (λ_k') and expert mark matrix (A_k), and normalizing G into G'.

Step6: calculating attribute entropy weight (ω_j') by equation (13).

Step7: calculating a new group mark result (X') according to the expert adjustable weight (λ_k') and attribute entropy weight (ω_j').

Step8: calculating difference distance (Γ) by equation (14), and judging whether $\Gamma \leq \gamma$, if $\Gamma \leq \gamma$, then the calculation is tending to stability. Otherwise, turning to step3 and adjusting until satisfy a certain condition.

Step9: displaying the tender evaluation result (X') and choosing the successful tenderer.

3 Case Analysis

An office building is frame structures, building area: 8715 m2, bid bottom: 1870 thousand Yuan. In the evaluating process, there are five major factors in considering: quotation, time, quality, reputation and achievement, i.e. $\{f_1 f_2 f_3 f_4 f_5\}$. There are four tenderers, i.e. $\{C_1 C_2 C_3 C_4\}$. To adopt experts marking method, five experts mark every factor of bidding schemes based on a ten-point system. Set experts as $\{d_1 d_2 d_3 d_4\ d_5\}$. The value of evaluation factors of bidding schemes is as shown in table 1.

Table 1. Expert Evaluation

Bid Schemes	d_1				
	Quotation f_1	Time f_2	ty f_3	tion f_4	ment f_5
C_1	9	8	9	8	9
C_2	8	6	9	7	9
C_3	9	9	9	8	6
C_4	9	9	8	6	9
	d_2				
C_1	7	8	7	6	9
C_2	7	7	9	4	9
C_3	7	9	7	6	6
C_4	9	7	8	8	9
	d_3				
C_1	7	7	9	7	9
C_2	9	7	9	6	7
C_3	7	9	8	6	8
C_4	9	9	9	5	9
	d_4				
C_1	9	8	7	6	9
C_2	9	8	9	6	7
C_3	8	9	7	7	7
C_4	9	6	7	5	9
	d_5				
C_1	8	9	8	8	9
C_2	7	7	9	7	8
C_3	9	9	9	8	8
C_4	9	9	8	6	9

Firstly, let every expert weight is equal, i.e.$\lambda_k = 0.2$. Attribute weights can be given by the methods to subjectively determine the weight, i.e. $\omega = (0.238,0.122,0.238,0.25,0.152)$. (The computation processes were omitted)

Group evaluation results were given by equation (2) (4), i.e. $X = (0.463,0.314,0.372, 0.451)$.The sequence is $C_1 \succ C_4 \succ C_3 \succ C_2$.

Secondly, editing program with C language for algorithm procedures, and let $\gamma = 0.0001$. The result tend to be stable after 10 iterations when $\Gamma \leq \gamma$. The final

experts the synthesis weights, attribute weights and evaluation result are outputted. The running processes of data are separately listed in table2, table3 and table4.

Table 2. Change of expert weight

n	1	2	3	4	5	6	7	8	9	10
d_1	0.135	0.08	0.088	0.09	0.09	0.09	0.09	0.09	0.09	0.09
d_2	0.301	0.251	0.26	0.265	0.271	0.272	0.274	0.274	0.275	0.275
d_3	0.185	0.279	0.289	0.305	0.310	0.315	0.315	0.317	0.316	0.317
d_4	0.206	0.16	0.117	0.096	0.088	0.084	0.083	0.082	0.082	0.082
d_5	0.173	0.23	0.245	0.244	0.241	0.239	0.238	0.237	0.237	0.237

Table 3. Change of attribute weight

n	1	2	3	4	5	6	7	8	9	10
f_1	0.117	0.144	0.152	0.158	0.161	0.162	0.163	0.163	0.163	0.164
f_2	0.242	0.256	0.269	0.276	0.277	0.278	0.278	0.278	0.278	0.278
f_3	0.119	0.103	0.091	0.085	0.084	0.083	0.083	0.083	0.083	0.083
f_4	0.163	0.178	0.18	0.179	0.178	0.178	0.178	0.178	0.177	0.177
f_5	0.359	0.319	0.308	0.302	0.3	0.299	0.299	0.298	0.298	0.298

Table 4. Change of the tender evaluation result

n	1	2	3	4	5	6	7	8	9	10
C_1	0.639	0.617	0.61	0.615	0.613	0.612	0.611	0.611	0.611	0.611
C_2	0.322	0.256	0.247	0.244	0.245	0.245	0.246	0.246	0.246	0.246
C_3	0.405	0.423	0.436	0.44	0.44	0.439	0.439	0.439	0.438	0.438
C_4	0.657	0.65	0.677	0.691	0.7	0.703	0.705	0.706	0.706	0.706

Finally, the evaluation result is $X' = (0.6110.2460.438\ 0.706)$. The final sequence is$C_4 \succ C_1 \succ C_3 \succ C_2$. Obviously, scheme 4 is the best. The method considers the expert weight and index weight, and make adjustment adaptive based on the methods to subjectively determine the weight.

4 Summary

In the current mark process, some experts generally are invited to make the multi attribute decision-making for some bidding schemes, so both expert weight and attribute weight must be considered. Experts' weights considered to be equal used to be neglected. Then information provided by every expert is not rationally utilized and makes the evaluation results lose objectivity. Based on entropy weight and deviation degree, this paper adjusts expert weight and calculates index entropy weights, and obtains a new expert weight and a new attribute weight. Thus, the new evaluation result is built. This paper carries out the qualitative and quantitative system thought and makes evaluation result more objective. The model mentioned above has good maneuverability and practicability.

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The Training Program for Product Design Engineers of Automotive Industry in China

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Abstract. With the development of automotive industry, the product design of Auto becomes more important. Product designers should master the composite knowledge of engineering, aesthetics as well as social science and have abundant experience of practice. The graduates from a single subject in China are unfitted for product engineer. A new training program for product engineer has been introduced based on the theory of interdisciplinary design curriculum and the practice project. We will introduce the milt-disciplinary curriculum, process of training, program of practice and the target of the training program. One simple and efficient style is introduced to achieve the goal of updating and developing more widespread approaches to the education and training of modern product design.

Keywords: Product design engineer, Training program, Multi-discipline, Practice project.

1 Introduction

Automobile industry is booming in China and the International competition has increased the demands on product design, which is a generic work for the creation of an object that originates from design ideas –in the form of drawings, sketches, prototypes or models – through a process of design that can extend into the objects production, logistics, and marketing[1]. The product design process involves stages of product planning, concept design, product development, product styling and detail design[2]. The design of automotive industry in China is fresh and has a long way to go. The product designed by the engineer of automotive has to have double properties. First, the product must be manufactured easily and satisfy the demand of engineering. Second, it should be felt beauty when the consumer sits in the car.

In generally, product design engineering is composed of an integration by two traditionally disparate fields – (mechanical) engineering and industrial design. But we also recognize in recently that the obligation of enterprise is not only to compete in a highly competitive global economy, but also to share social well-being

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and restore the nature environment upon which all life-- and technology—depend[3]. In this sense, the product designer should be educated with sense of value-system of society. So it is important for designer to understand the social and culture context of technologies and the design processes.

Unfortunately, arrangement of curriculum of high-education in China is based on the subject such as material science, automotive engineering and aesthetics. Education in academy focuses either on the engineering or on aesthetics. As a consequence, product design is often taught as a component of the mechanical engineering curriculum or taught in design schools as a specific incarnation of industrial design.

Here we give an example of the curriculum in China to bring up the product engineer for automobile. The product designers come from mainly the graduate of subject of material and automobile. The main courses of polymer material and engineer in Jilin University are:

Physical Chemistry
Organic Chemistry
Polymer Physical
Polymer Chemical

While the course of the discipline of automobile includes:

Automobile Structure
Automobile Theory
Automobile Design

The subject of industrial design has been established in some university. The curriculum of such subject involves the aspect of engineering and the aspect of aesthetics. But it is just an addition of courses from different subject. Graduate students that have been taught and trained in academy or university of China can't meet the need of enterprise of the product designer.

It is time to change our conception of education in engineering. We should focus on the function of the position in manufacturer and practical requirement of enterprise to design our training program. Product engineers need to master the composite knowledge of engineering, aesthetics and social science and have abundant experience of practice. We develop a new style of training program based on the theory of interdisciplinary design curriculum[3,7] and the practices project[4] which includes the curriculum and process of training.

2 Training Program

In four years, 27 subjects should been taught including 14 specific engineering subjects, 7 subjects led by the design faculty, 3 subjects on art and 3 selective subjects which are connected with automotive industry. There are also two professional projects in school at the last year and one practice project in manufacturer at the last semester. At the end of each semester, team discussion will be held(Fig. 1).

2.1 Conception and Theory

Conception is used to express the basic figures of the thing, such as definition, function, property and so on. If we want to enter a new field, we must master the conception. It is impossible to the handle the stuff of the field until we learn the basic conception. What is theory? Theory is to be given an insight description of the substance which involves the instinct and law beyond the conception, such as engineering mathematics machine theory and theory mechanics.

2.2 Tools and Application

They are organized to meet the desire of the engineering. The theory knowledge is mostly an analytic technology belonging to a single subject. So it is difficult to be used to solve the problem in engineering. Students have to learn some skills of tool for which the practicality is more important. For a product design engineer of automobile, being familiar with the property of material and the relationship of different part is critical rather than investigating what is basic principle and how it is computed. The subject of material and process, automotive structure and Engineering Charting and Computer Cartography is arranged for the product designer.

2.3 Project Practice

Training exercise aims at providing practical working knowledge of the products and manufacturing processes. The practical training of product design students must be systematic and organized. Based on the interview and analyses they have concluded. There are interesting possibilities to increase productivity in product development in manufacturing industry by introducing a better organized training for industrial design student [4]. It makes the students understand the knowledge learned in lecture well and should been complete in parallel with the in class's course in order to reinforce the knowledge.

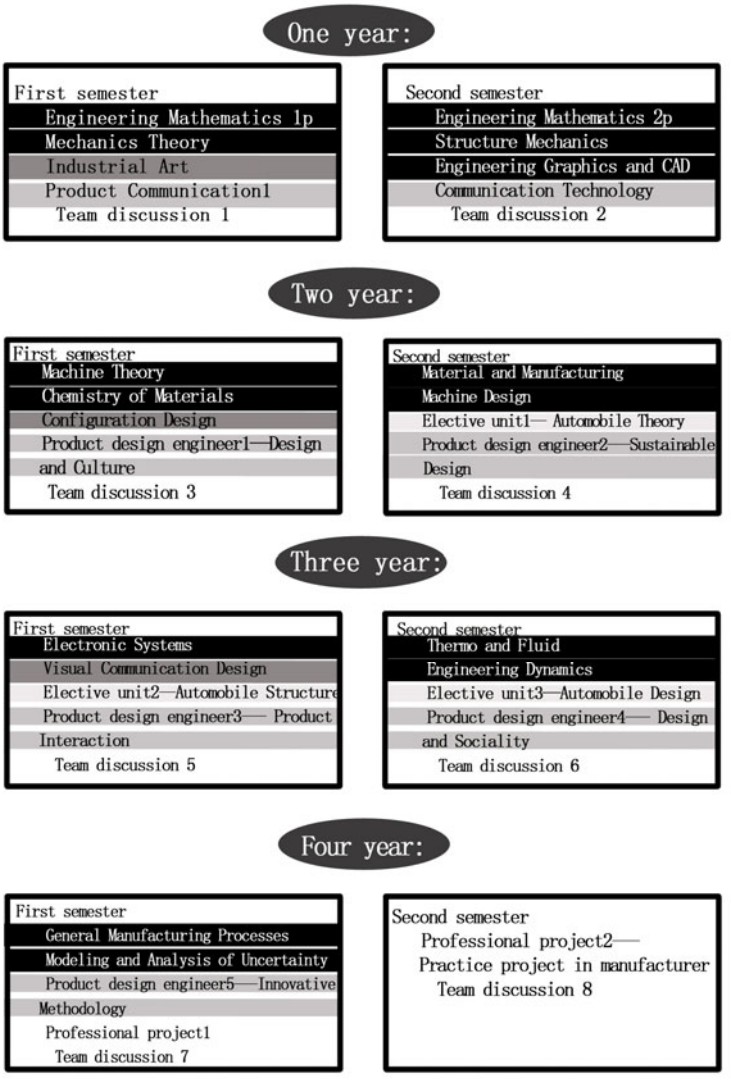

Fig. 1. The curriculum of the training program

In the last half year, mechanical engineering design course carries out in practice facing to custom in the manufacturer. The students are divided into teams and involved with a manufacturer of automatic door. In this course, the main focus is to develop the design solution for a product from the desire of the customer. The business tools and design approach of the company are promised to been used in the performance of their designing work. In this way they familiarize themselves with concepts such as user-oriented values, as well as design concepts such as Design for Assembly (DfA), Design for Manufacture (DfM) and Design for the

Environment (DfE) [5]. So the student could learn all kinds of techniques and methods used for new product design in business practice.

2.4 The Method of Teaching for Multi-disciplinary

In the beginning of the training program, students are separated into different teams. Different product design task are mentioned to the students in each team. In the end of the program, final product should be presented. Student could learn different knowledge and skills to develop the product at different stage of the training program. The courses of different subject are taught in the environment of specialization in common with the student of that subject. At the end of each semester, there is a team discussion for the design. The team should be consisted of students from different disciplinary, who bring different ideas and approaches to problem and provide a more holistic perspective to the design problem and tutors with industry experience, who brought a range of technical and business expertise into the team discussion. All courses are relative with the design task [6]. It makes the student interested in with the lecture and having a deep understand of the knowledge of different in the course of usage.

Ability or outcome from the training program:

- Discussing and learning with students from different disciplinary gain new ideas and thought to solve the problem in the work
- Give rise to passion and motivation to learn knowledge in discussion and in the process of resolving actual problem
- Realize and learn the importance of aesthetics and emotional qualities for product
- Improving the ability of working on actual problem for an actual company and making it easy dealing with the problem facing in the job
- Communication, team work and sense of creativity and visualization
- Hand-on molding and drawing shills, technical skills including machining ,computer aided design(CAD)
- The understanding of basic engineering science ,manufacturing and art culture
- How a product will be situated in our lives and the art of reading a user and the skills of analysis based on the market and human factors
- An ability to working at all scales of a product's context and life history.

3 Summary

It is challenging and complex for education and training in the field which span discipline and is changing so rapidly. Through organized and practiced properly, the program promote the level of the design and make the student competitive in the field of product design of automotive industry. It is hoped that through this program, the field of education of engineer will continue to expand and improve the ways and means by which we improve the competition in the field of product design.

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A Multi-agent Economic Simulation System

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Abstract. This paper presents a multi-agent dynamic model to simulate the running of a national macro economy, which is based on the structural growth model in [1], and an algorithm computing the exchange outcome of a monetary exchange process is also introduced. Monetary economic variables such as the interest rate, price index, credit balances etc. are taken into account in the system. And a simulation with Cobb-Douglas production and utility functions is conducted to illustrate the system. The model presented in this paper involves many variables and parameters, which provide enough flexibility and enable us to obtain insights into the complex economic dynamics in the real world when we use the model in theoretical economic analysis.

Keywords: Agent-Based Computational Economics, Structural Growth Model, Simulation.

1 Introduction

Computer simulation nowadays plays a more and more important role in both economics teaching and research, which enables us to study the complex economic processes and phenomena by numerical methods. And on the basis of simulation, the so-called Agent-Based Computational Economics (ACE) emerges, which develops complex economic models from bottom-up and pays much attention to the behavioral patterns of economic agents (i.e. firms, consumers, banks etc.) and the interactions among agents, hence macro economic phenomena are explained by micro behaviors of economic agents (e.g., see [2,3]).

In this paper an economic simulation system (i.e. a dynamic economic model) will be developed based on the structural growth model in [1]. The model can be used to simulate the dynamics of prices, interest rate, outputs, demands, supplies etc of a national macro economy. And a simulation with Cobb-Douglas production and utility functions will also be conducted to illustrate the simulation system.

2 The Dynamic Model

Here we will model an n-commodity, m-agent (i.e. firms and consumers) national economy. Let's regard the economy as a discrete-time dynamic system and suppose economic activities such as price adjustment, exchange and production etc. occur in

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turn in each period (see [1]). Like the treatment in [4], the production functions of firms and the utility functions of consumers will be expressed in the form of input and output coefficient matrices, which usually are functions of prices. In fact, the works in [4, 5, 6] show that the input and output coefficient matrices usually contain the same information as the production functions and the utility functions.

And the state of the economy in period t is represented by following variables.

$\mathbf{A}^{(t)}$ $n\times m$ input coefficient matrix, which equals $\mathbf{A}(\mathbf{p}^{(t)})$.

$\mathbf{B}^{(t)}$ $n\times m$ output coefficient matrix, which equals $\mathbf{B}(\mathbf{p}^{(t)})$.

$\mathbf{c}^{(t)}$ Credit m-vector, which consists of the credit balances of m agents in period t. When $\mathbf{c}_i^{(t)}$ is positive, agent i has a deposit balance; when $\mathbf{c}_i^{(t)}$ is negative, agent i has a loan balance.

$\mathbf{d}^{(t)}$ Demand m-vector, which consists of demand amounts of m agents in period t.

$\mathbf{h}^{(t)}$ Cash m-vector, which consists of the cash amounts held by m agents in period t.

$\mathbf{p}^{(t)}$ Price n-vector, which is positive and consists of prices of n commodities in period t.

$r^{(t)}$ Interest rate in period t.

$\mathbf{S}^{(t)}$ $n\times m$ supply matrix, whose (i, j) entry stands for the agent j's supply amount of commodity i in period t. An agent is assumed to supply one commodity, that is, each column of $\mathbf{S}^{(t)}$ has only one positive entry. And $\mathbf{s}^{(t)} \equiv \mathbf{S}^{(t)}\mathbf{e}$ denotes the supply vector, which is assumed to be positive. Here $\mathbf{e}$ denotes the all-one vector.

$\mathbf{u}^{(t)}$ Sales rate n-vector, which consists of sales rates of n commodities in period t.

$\mathbf{z}^{(t)}$ Exchange m-vector and activity level vector, which represents the amounts of standard input bundles that are purchased and put into production by agents in period t; and in the special case $\mathbf{B}=\mathbf{I}$, $\mathbf{z}^{(t)}$ is also the output vector which indicates the output amounts of agents. $\mathbf{I}$ denotes the identity matrix.

The dynamic model consists of the following equations.

$$\mathbf{p}^{(t+1)} = \left((1-\theta^{\mathrm{P}})\mathbf{I} + \theta^{\mathrm{P}} \left\langle \mathbf{A}^{(t)}\mathbf{d}^{(t)} \right\rangle \left\langle \mathbf{s}^{(t)} \right\rangle^{-1}\right)\mathbf{p}^{(t)} \tag{1}$$

$$r^{(t+1)} = r^{(t)}\, \mathbf{p}^{(t+1)T}\mathbf{A}^{(t)}\mathbf{z}^{(t)} \Big/ \left(\mathbf{p}^{(t)T}\mathbf{A}^{(t)}\mathbf{z}^{(t)}\right) \tag{2}$$

$$\mathbf{S}^{(t+1)} = \mathbf{B}^{(t)} \left\langle \mathbf{z}^{(t)} \right\rangle + \theta^{\mathrm{D}} \left(\left\langle \mathbf{e} - \mathbf{u}^{(t)} \right\rangle \mathbf{S}^{(t)} \right) \tag{3}$$

$$\mathbf{d}^{(t+1)} = \left\langle \mathbf{p}^{(t+1)T}\mathbf{A}^{(t+1)} \right\rangle^{-2} \left\langle \mathbf{p}^{(t+1)T}\mathbf{B}^{(t+1)} \right\rangle^{2} (1+r^{(t+1)})^{-1} \mathbf{S}^{(t)T} \left(\left\langle \mathbf{A}^{(t)}\mathbf{d}^{(t)} \right\rangle \left\langle \mathbf{s}^{(t)} \right\rangle^{-1} \left\langle \mathbf{u}^{(t)} \right\rangle \right)^{\theta^{\mathrm{S}}} \tag{4}$$

$$\mathbf{c}^{(t+1)} = \mathbf{c}^{(t)}(1+r^{(t)}) + \mathbf{h}^{(t)} - \left\langle \mathbf{p}^{(t+1)T}\mathbf{A}^{(t+1)} \right\rangle \mathbf{d}^{(t+1)} \tag{5}$$

$$\left(\mathbf{h}^{(t+1)}, \mathbf{z}^{(t+1)}, \mathbf{u}^{(t+1)}\right) = Z\left(\mathbf{A}^{(t+1)}, \mathbf{d}^{(t+1)}, \mathbf{p}^{(t+1)}, \mathbf{S}^{(t+1)}\right) \tag{6}$$

Eq.1 stands for the price adjustment process. $\mathbf{A}^{(t)}\mathbf{d}^{(t)}$ indicates the demand amounts of *n* commodities in period *t*. And $\left\langle \mathbf{A}^{(t)}\mathbf{d}^{(t)} \right\rangle \left\langle \mathbf{s}^{(t)} \right\rangle^{-1}$ indicates the ratios of demand amounts to supplies amounts. Here $\langle \mathbf{x} \rangle$ denotes the diagonal matrix with the vector $\mathbf{x}$ as the main diagonal. θ^{P} is the coefficient of price adjustment speed.

Eq.2 stands for the adjustment process of the interest rate. $\mathbf{p}^{(t+1)T}\mathbf{A}^{(t)}\mathbf{z}^{(t)} \Big/ \left(\mathbf{p}^{(t)T}\mathbf{A}^{(t)}\mathbf{z}^{(t)}\right)$ is the price index in period *t*+1. Here the interest rate is adjusted based on the price index so as to avoid currency inflation and deflation.

Eq.3 indicates the formation of supplies in period *t*+1. $\mathbf{B}^{(t)}\left\langle \mathbf{z}^{(t)} \right\rangle$ is the output matrix in period *t*, whose (i, j) entry stands for the output amount of commodity *i* by agent *j* in period *t*. θ^{D} is the depreciation coefficient, and $\left\langle \mathbf{e}-\mathbf{u}^{(t)} \right\rangle \mathbf{S}^{(t)}$ is the inventory matrix in period *t* (see [1]).

Eq.4 stands for the formation of demands in period *t*+1. The demands are affected by profit levels (i.e. $\left\langle \mathbf{p}^{(t+1)T}\mathbf{A}^{(t+1)} \right\rangle^{-1} \left\langle \mathbf{p}^{(t+1)T}\mathbf{B}^{(t+1)} \right\rangle$), the interest rate, demand-supply ratios and sales rates. θ^{S} is the demand smooth coefficient. And the difference between the demand value and cash-in-hand of each agent is assumed to be balanced by financial credit.

Eq.5 stands for the formation of credit balances. $\mathbf{h}^{(t)}$ is the cash vector in period *t*, and $\left\langle \mathbf{p}^{(t+1)T}\mathbf{A}^{(t+1)} \right\rangle \mathbf{d}^{(t+1)}$ indicates the cash needed by agents to purchase their demanded commodity bundles in the forthcoming exchange process.

Eq.6 stands for the exchange process. $(\mathbf{h}, \mathbf{z}, \mathbf{u}) = Z(\mathbf{A}, \mathbf{d}, \mathbf{p}, \mathbf{S})$ is the exchange function. Each agent tries to sell his supply and buy his demand commodity bundle (indicated by $\mathbf{A}$ and $\mathbf{d}$) with cash in the exchange process. The vector $\mathbf{h}$ indicates the cash amounts held by agents after the exchange process. The exchange function can be described by the following algorithm:

Step 1. Let *n*-vector $\bar{\mathbf{s}}$ stand for the supply amounts of commodities, and whose initial value is set to $\mathbf{s} \equiv \mathbf{Se}$. Set all components of the exchange vector $\mathbf{z}$ to -1;

Step 2. For all agents with 0 demands, set their exchange amounts in $\mathbf{z}$ to 0;

Step 3. All agents with -1 exchange amounts in $\mathbf{z}$ are referred to as current exchanging agents. On the basis of the demands of current exchanging agents, the total demand vector is computed. Among all commodities with positive demands, we can find a commodity (called a constraining commodity) with the smallest supply-demand ratio (denoted by β). If β is no less than 1, set all -1 components of $\mathbf{z}$ equal to the corresponding components of $\mathbf{d}$; otherwise, find those current exchanging agents who demand the constraining commodity, and set their exchange amounts equal to β times the corresponding components of $\mathbf{d}$, and subtract those sales amounts from $\bar{\mathbf{s}}$;

Step 4. If $\mathbf{z}$ has any -1 component, go to Step 3; otherwise, set the sales rate vector $\mathbf{u} = \langle \mathbf{s} \rangle^{-1} \mathbf{Az}$, set the cash vector $\mathbf{h} = \left\langle \mathbf{p}^T\mathbf{A} \right\rangle (\mathbf{d}-\mathbf{z}) + \left(\mathbf{p}^T \langle \mathbf{u} \rangle \mathbf{S}\right)^T$ and quit.

3 The Simulation

Here we suppose there are two firms producing commodity 1 and 2 respectively, and a laborer (also a consumer) supplying labor. Suppose the production functions of firms are $5x_1^{0.6}x_2^{0.1}x_3^{0.3}$ and $3x_1^{0.4}x_2^{0.4}x_3^{0.2}$ respectively, which are Cobb-Douglas type, and the utility function of the laborer is $x_1^{0.2}x_2^{0.7}x_3^{0.1}$, which is also Cobb-Douglas type. And suppose the laborer supplies 100 units of labor in each period. By general equilibrium analysis (e.g., see [4]), the equilibrium outputs of two firms can be computed to be 1727.9 units and 679.26 units respectively, and with labor as numeraire the equilibrium prices of commodity 1 and 2 are 0.1157 and 0.2208 respectively.

To run the model, we set the initial values as $\mathbf{c}^{(0)} = \mathbf{0}$, $\mathbf{d}^{(0)} = \mathbf{e}$, $\mathbf{h}^{(0)} = \mathbf{e}$, $\mathbf{p}^{(0)} = \mathbf{e}$, $r^{(0)} = 0.05$, $\mathbf{S}^{(0)} = \mathbf{I}$, $\mathbf{u}^{(0)} = \mathbf{e}$, $\mathbf{z}^{(0)} = \mathbf{e}$. The coefficient of price adjustment speed (i.e. θ^{P}) is set to 0.2. Both the depreciation coefficient θ^{D} and the demand smooth coefficient θ^{S} are set to 0.1.

In this simulation, we suppose the supply amount of labor is exogenous, that is, in each period we set the (3, 3) entry of $\mathbf{S}^{(t)}$ (i.e. the supply amount of labor) to 100. And we also suppose that the laborer always expends all his income (i.e. wage), hence the demand of the laborer will be computed on the basis of the cash amount in his hand and the market prices.

Fig. 1 shows the prices and outputs in the simulation, and Fig. 2 shows the price index and interest rate in the simulation.

The simulation results show that the system is approaching the equilibrium. In fact, with labor as numeraire, the prices of commodity 1 and 2 in period 200 are about 0.1196 and 0.2293 respectively, which are quite close to the equilibrium prices.

Note that the price index stays below 1 in latter periods, the economy undergoes a moderate currency deflation. And as a result, the interest rate is kept cutting to offset the currency deflation, and such simulation results remind us the economic facts in Japan in recent years. Note that the technology progress and the growth of labor supply are excluded here, both the equilibrium growth rate and the equilibrium interest rate in this economy equal zero. Hence Fig. 2 indicates that the interest rate is also approaching the equilibrium interest rate.

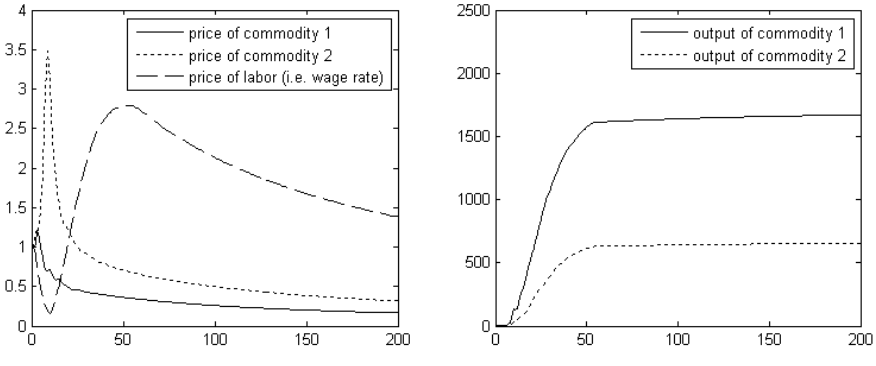

Fig. 1. Prices and Outputs

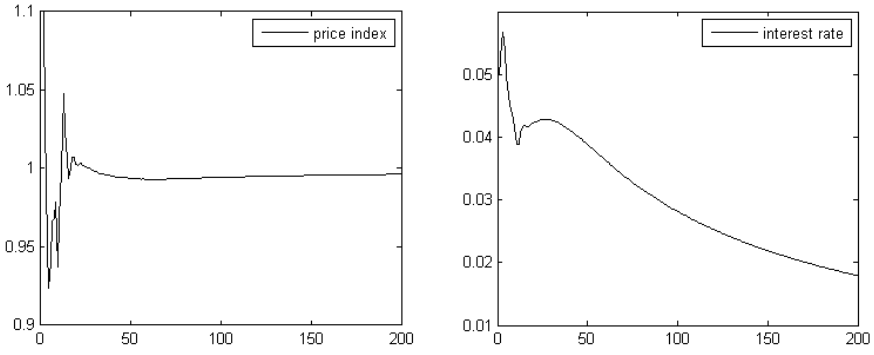

Fig. 2. Price Index and Interest Rate

4 Concluding Remarks

Like other ACE models, the model presented in this paper involves many variables and parameters, that is, the model involves many degrees of freedom. However, this point shouldn't be regarded as a weakness. When we use the model in theoretical economic analysis, many degrees of freedom provide enough flexibility and enable us to obtain insights into the complex economic dynamics in the real world. Moreover, the number of equations in the model is quite small, and this point facilitates the analytical equilibrium analysis of the model.

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A Bi-level Programming Model for a Multi-facility Location-Routing Problem in Urban Emergency System

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Abstract. This paper presents a bi-level programming model for a bi-objective multi-depot location-routing problem in urban emergency system. The problem is decomposed into two levels: the above objective is to maximize the total time satisfaction served and the second objective is to minimize the total cost, including the fixed and variable cost of the facilities and variable delivery cost. The improved genetic algorithm is used to solve the problem. The computational results show that the proposed model for location-routing problem is valid.

Keywords: emergency logistics, location-routing problem, bi-level programming, genetic algorithm.

1 Introduction

In recent years, natural disasters occur frequently. It is a challenge to plan the efficient supply of disaster relief and establish a disaster management system, which includes two key components of a logistics system, namely the facility location and the vehicle routing. Most studies related to this family of problems have solving the two sub-problems separately, which often leads to sub-optimal solutions (Wei et al., 2007; Chang et al.,2007; Sheu, 2007) . Compared with LRP in general logistics (Nagy, 2007), LRP in emergency logistics is more complex, and there is little work on the issue (Yi, 2007; Xu, 2008; Zeng, 2010). This paper proposes a bi-level programming model for LRP in emergency system, which is to maximize the total time satisfaction served and minimize total cost. Genetic algorithm with computational experiments are provided, which shows that the model is effective.

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2 Problem Formulation

LRP in emergency logistic can be defined as follows. Let I denote the set of indices of the affected destination nodes, $I \in \{1,2,...,m\}$; J denote the set of indices of potential emergency supply facilities, $J \in \{1,2,...,n\}$; and K denote the set of indices of vehicles, $K \in \{1,2,...,k\}$, and $i \in I$, $j \in J$, $k \in K$. Let $g(g \in (I \cup J)), h(h \in (I \cup J))$ denote the nodes in emergency logistics network; p_j is the fixed and variable cost for the emergency supply facility j; q_i is the demand quantities of affected place i; Q_j denotes the capacity of facility j; d_{gh} is the shortest travel distance between node g and h on the network; v_{gh} is vehicle speed from node g to node h; c_{gh} denotes travel cost from node g and node. y_j, f_{ij}, s_{jk} and μ_{ghk} are the decision-making variables. If facility j is selected, then $y_j = 1$; otherwise $y_j = 0$. If disaster place i is serviced by facility j, then $f_{ij} = 1$; otherwise $f_{ij} = 0$. If emergency facility j is through route k, then $s_{jk} = 1$; otherwise $s_{jk} = 0$. If vehicle k travel from node g to node h, then $\mu_{ghk} = 1$; otherwise $\mu_{ghk} = 0$.

2.1 Upper-Level Programming Model

$$Minimize \quad \sum_{j \in J} p_j y_j + \sum_{g \in (I \cup J)} \sum_{h \in (I \cup J)} \sum_{k \in K} c_{gh} d_{gh} \mu_{ghk} \tag{1}$$

$$subject\ to \quad \sum_{j \in J} y_j \geq \sum_{j \in J} s_{jk}, \forall k \in K \tag{2}$$

$$\sum_{j \in J} s_{jk} = 1, \forall k \in K \tag{3}$$

$$s_{jk}, y_j \in \{0,1\}, \forall j \in J, k \in K \tag{4}$$

The objective function (1) of upper-level programming model is to minimize the sum of opening facility costs and the routing costs. Constraint (2) ensures the disaster places are served by the selected emergency facilities. Constraint (3) ensures that there is only one emergency facility j can supply services through one route k. Constraints (4) are standard binary restrictions on the variables.

2.2 Lower-Level Programming Model

Lower-level programming model of LRP in emergency logistics system is:

$$Maximize \quad \sum_{i \in I} \sum_{j \in J} \tau(t_{ij}) \tag{5}$$

$$subject\ to \quad \tau(t_{ij}) = \begin{cases} 1, 0 \le t_{ij} \le l_i \\ \dfrac{u_i - t_{ij}}{u_i - l_i}, l_i < t_{ij} < u_i \\ 0, t_{ij} \ge u_i \end{cases} \tag{6}$$

$$\sum_{i \in I} \sum_{j \in J} \mu_{ijk} q_i \le Q_j, \forall k \in K \tag{7}$$

$$\sum_{i \in I} \sum_{h \in (IUJ)} \mu_{ihk} = 1, \forall k \in K \tag{8}$$

$$\sum_{i \in I} \sum_{j \in J} \mu_{ijk} \le 1, \forall k \in K \tag{9}$$

$$\sum_{g \in (I \cup J)} \mu_{ghk} - \sum_{g \in (I \cup J)} \mu_{hgk} = 0, \forall h \in (I \cup J)\ ,\ k \in K \tag{10}$$

$$t_{ij} = (t_g + \frac{d_{gh}}{\upsilon_{gh}}) \mu_{ghk} \tag{11}$$

$$f_{ij}, y_j \in \{0,1\}, \forall i \in I, j \in J \tag{12}$$

$$\mu_{ghk} \in \{0,1\}, \forall g \in (I \cup J), h \in (I \cup J), k \in K \tag{13}$$

The object function (5) is to maximize the time satisfaction of emergency relief. Constraint (6) defines the time satisfaction of the emergency service facilities respond to the disaster places. Constraint (7) ensure that emergency facility j capacities are not less than all the materials supplies of the disaster places on the route associated with facility j; Constraint (8) ensures that every disaster place must be served by one vehicle. Constraint (9) ensures that each vehicle sets out from no more than one emergency facility. Constraint (10) ensures that the continuity of all the routes. Constraint (11) defines the actual time of vehicle arrive at the disaster places. Constraints (12) and (13) are standard binary restrictions on the variables.

3 Genetic Algorithm

Real-number encoding of genetic algorithm can solve the multi-facility location-routing problem, which is non-continuous and the non-convex (Tiao et al., 2005).Therefore, real-number encoding is applied in this paper. Each chromosome includes three parts. The first part of the chromosome has k genes, where k is the number of rescue vehicles; length of the second part is m, where m is the number of disaster places; the third part of the chromosome has m genes and couldn't duplicate each other. Then the length of chromosomes is $k+m+m$.The objective function of upper-level programming is to find out the minimum cost, while the genetic algorithm is to evaluate chromosome viability by fitness. Transforming the

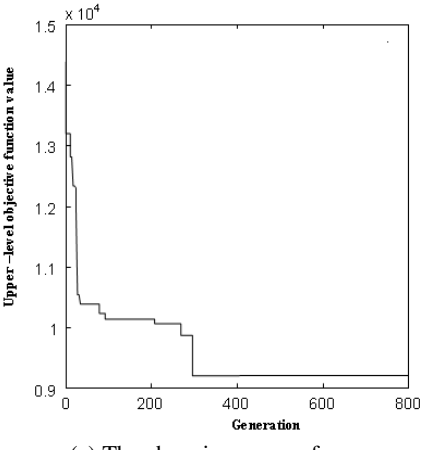
function of upper-level programming into the fitness function can fully combine evaluation criteria. In this paper, the transform method is as the following:

$$f_i(l) = \exp\{-(f(i) - f_{\min}) / l\} \tag{15}$$

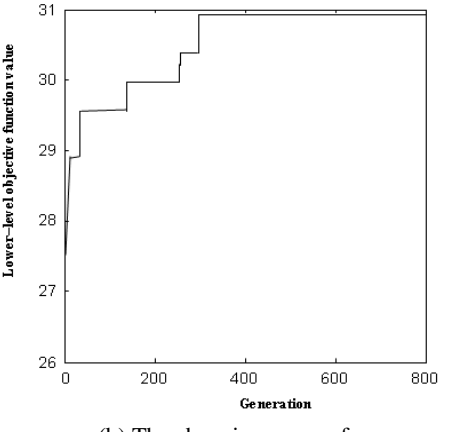
where $f_{\min}$ is the minimal individual of the population. Then we use the roulette-wheel selection and elitist selection (Zhang et al., 2004) combined strategy in the improved genetic algorithm. The single-point crossover and exchange mutation operators are applied in the first part of chromosome; the two-point crossover and exchange mutation operators are applied in the second part of chromosome; the partially mapped crossover and reverse exchange mutation operators are applied in the third part of chromosome. When genetic generation is larger than the maximal genetic generation, then terminate genetic algorithm.

4 Simulation Results

We carry out the computational experiments with 8 rescue vehicles from 5 emergency supply facilities which provide emergency supplies to 23 disaster places. The changing curves of population with generation are shown in Figure 1(a) and 1(b). The best solution of the upper-level programming model is 9240, and the best solution of the lower-level programming model is 30.89. Therefore, the computational results indicate that the above models and methods are effective.



(a) The changing curve of total cost for LRP



(b) The changing curve of the time satisfaction for LRP

Fig. 1. The output results are shown in Figure 2. From Figure 2, it shows that the emergency facilities 1, 3 and 4 are selected.

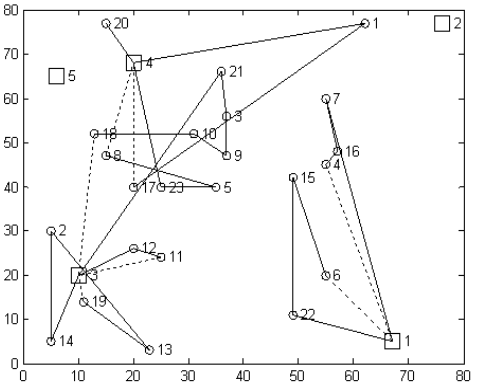


Fig. 2. Output results

5 Conclusion

To improve the efficiency of urban emergency systems, a bi-level programming method is proposed to establish the model of combined location routing problem (LRP), the upper-level programming model considers the emergency facilities location problem, the lower-level programming model considers the vehicle routing problem. Genetic algorithm is proposed to solve the model. The results show that genetic algorithm can solve the location-routing problem of urban emergency system within a reasonable computational time.

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The Comparative Study of the Effect of Incentives and Punishments in the Corporation

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Abstract. The theory of incentives has been developing rapidly, becoming mature, and widely used in management, sociology, etc.. However, up to now, there is not a unified, generally accepted theoretical model. In this study, we designed two behavioral experiments—incentives one and punishments one to try to find out the difference of performance results between the motivated and punished. We get the results from these two behavioral experiments to develop the unified model of incentives and punishments as a commercial, contractual one by using the method of cost-benefit combined with the consideration of irrational, social, psychological factors, and try to put it into practice in the enterprise management. As a conclusion, basically, we prefer incentives to punishments for employees in the corporation.

Keywords: incentives, punishments, corporation.

1 Introduction

The received view in economic reasoning is that an increase in the financial incentives provided for an activity is expected to generate an increase in performance. Quite symmetrically, a punishment of any sort, such as a fine or a detention, is expected to result in a reduction of the behavior that is being targeted[1, 2].These predictions are implied by very basic assumptions in economic theory: performance is positively related to effort; effort is unpleasant, as is punishment; and money is good [2].

However, these predictions have been proved not true by many experimental tests, both in a controlled laboratory environment and in field studies[2]. There are several different explanations relevant to the effect of rewards on behavior. In the past four decades, behaviorist theory was, for completely different reasons, of the same opinion as standard economics[2]. According to classical conditioning, reward offered for an activity that is in itself neutral or even mildly unpleasant, will eventually associate a positive value to that activity. So a past reward has in the long run a positive effect on the performance of that activity. This conclusion of behaviorist psychology was challenged in the early seventies by the school of cognitive psychology. They put forward the alternative view that an activity has a

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motivation of its own, independent of any reward, called intrinsic motivation. A reward, different from this intrinsic motivation (in particular, but not only, a monetary reward) may replace the intrinsic motivation. The net effect may be a reduction of the overall motivation and hence a reduction of the activity itself. There are, of course, critical views of the entire theory of intrinsic motivation, for example, from Flora [3].

At present, the most convincing explanation seems to be based on cognitive arguments [2]. Contracts, social or private, are usually incomplete and regulate an interaction among players in a situation of incomplete information. The introduction of a reward modifies some of the terms of the contract, and also provides information. The change in behavior produced by the new terms in the contract may be a response to the combination of new payoff structure and new information, but the contract that is presented to them may change the way in which the game is perceived.

Till now, none of the above explanations is perfect or satisfying. The research in this area also requires a satisfactory theory of this form of certainty. In this study, we are trying to find out the relationship between incentives and rewards, and also the relationship between punishment and fines based on two experiments—an incentive one and a punishment one respectively, and trying to establish a simple theoretical model.

2 Experiment Design

We designed two experiments which were conducted at the Jinan University of China. The first experiment is relevant to incentives. The subjects were 100 male and female undergraduate students from all fields of study, with an average age of 20. The subjects taking part in the experiment were divided into 4 different groups of 25 students each, corresponding to 4 different treatments that we describe later. At the beginning of the experiment, each student was promised a fixed payment of 70 Yuan in RMB for participating. They were then told that the experiment would take 55 minutes and that they would be asked to answer a quiz consisting of 40 problems taken out of a logic test. The problems in the quiz were chosen to make the probability of a correct answer depend mostly on effort. In particular, the emphasis was placed on questions involving reasoning and computation rather than general knowledge. In the 4 different treatments, subjects were promised different additional payments for each correct answer. In the first group no promise and no mention was made of any additional payment. In the second group the subjects were promised an additional payment of 10 cents per question that they answered correctly. The promised amount was 40 cents and 90 cents respectively in the third and fourth groups.

The second experiment is relevant to punishment. This experiment is similar to the first one besides how to get scores. In this experiment, every subject is allocated a fixed reward, of 96 Yuan in RMB. The subject in the first group is

deducted 0 cent with a wrong answer, the subject in the second group is deducted 10 cents with a wrong answer, the subject in the third, fourth group is deducted 40 cents and 90 cents respectively with a wrong answer. These experiments are conducted twice in the same classroom with the same subjects.

3 Analysis of Experimental Results

The main summary statistics for the number of correct answers in different experiment are presented in table 1.

In the incentive experiment (Table1 (A)), the average number of correct answers was 13.64 out of 40 questions in the first group. The average rose to 14.64 in the second group, where subjects were getting an additional 40 cents per correct answer. The average fell to 13.68 in the third group. The average fell to its lowest point of 11.88 in the fourth group. Compare to the result of the incentive experiment, the average is much lower in the punishment experiment (Table1 (B)). The average was 9.4 in the first group, where subjects were not fined. The average rose to 11.92 and remained essentially unchanged from the second group to the third group. The average fell slightly to 10.16 in the fourth group.

A nonparametric Mann-Whitney U test based on ranks can be used to investigate whether the sample of correct answers came from populations with the same distribution. We report the results of a pair-wise comparison across treatments in table. The number in the intersection of a row and column indicates, for the corresponding pair of treatments, is the two-tailed significance value (Asymp. Sig. (2-tailed)) .Each two-tailed significance value estimates the probability of obtaining a *Z* statistic as more extreme (in absolute value) as the one displayed, if there truly is no effect of the treatment. This can tell us whether two samples come from the same distribution.

In incentive experiment (Table2 (A)), the difference between the distributions in the zero payment and 40 cents payment treatments is significant. The difference between the distributions in the treatments with higher payoffs of 10 and 90 cents is not significant. What's more, the difference is not significant between 40 and 90 cents. But in punishment experiment (Table2 (B)), the difference between 40 cents and 90 cents is significant. In fact, we find that in the punishment experiment, difference between groups is not significant by and large.

If we compare the mean scores of the two experiment, we can find that when the level of incentive or punishment is very low, the performance of the object urge rapidly, especially in the punishment experiment. However, when the level of punishment increased, the performance of the objects doesn't develop accordingly.

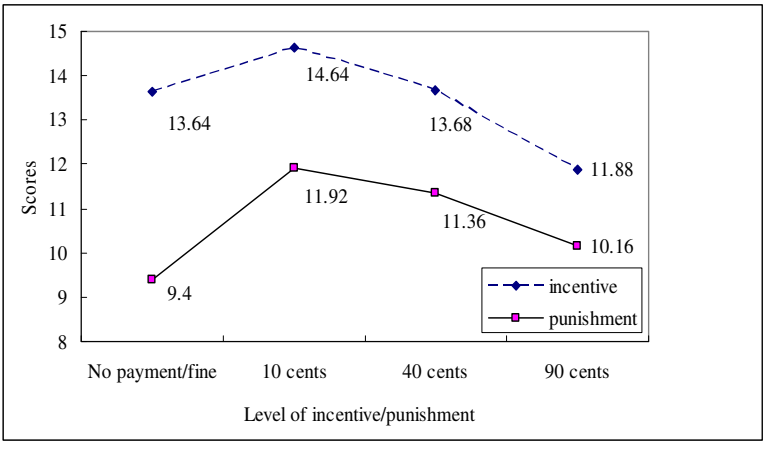

Fig. 1. The mean scores for the 2 experiments

4 Summary

In this study, the process of incentives and punishments is taken as a commercial one, the relationship between motivator and the motivated, and the relationship between the punisher and the punished as well are taken as contractual one, they just buy or sell the incentives and punishments like buying or selling some goods. We use the method of cost-benefit, combined with the consideration of irrational, social, psychological factors, to develop the unified model of incentives and punishments. In this model, the motivated and the punished make their decisions by using the method of cost and benefit. During this process, the decision-makers are affected by many social, psychological factors. Various kinds of irrational activities can be observed from the previous experiment, which can help us pay special attention to the activities with irrational looking, no pity which are resulting from different motivations [4].Various social, psychological factors which affect the preference, beliefs and activities of the motivated and punished are put into this model, such as the diversity of motivations [4,12] and internality of preferences[13,15] of the motivated and punished. As a result, we should pay special attention to the scenic and cognitive factors which affect the decision-making of the motivated and the punished, the complexity and diversity resulting from the abnormality of activities. This model we developed here, as an important part of behavioral economics, can be used to analyze and handle various problems relevant to incentive and punishment in many fields including management process, even in sociology (such as crime etc.)and psychology etc.

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The CDIO Teaching Practice of Mechanism Analysis and Design

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Abstract. According to the major CDIO training program of mechanical design, manufacturing and automation in Department of Mechanical and Electrical Engineering of Guangzhou University, based on the comprehensive curriculum in the traditional Theoretical Mechanics and Mechanical Theory, the course of Mechanism Analysis and Design is created, its contents are kinematics, dynamics, mechanism analysis and design, project-driven teaching methods is used, students are allowed to experience the full process of conceive, design, implementation, the combination of theory and practice is emphasized to enhance students' ability of creative design.

Keywords: mechanism analysis and design, CDIO, project-driven, innovative design.

1 Introduction

In Department of Mechanical and Electrical Engineering of Guangzhou University, the mechanical design manufacture and automation special major is congstructing, the knowledge points of mechanical major are optimized, the knowledge duplication is reduced, the kinematics and dynamics in traditional "Theoretical Mechanics", and analysis and design of mechanisms in "Mechanical Theory"course are arranged in a new course " Analysis and Design of Mechanisms". Many cases of teaching reform about "Mechanical Theory"course, such as Miao Zhong, et al reform the key stages of "Mechanical Theory"course, and practice, to enhance students' comprehensive abilities[1]. Jin Xiaoyi, et al study the three-dimensional teaching tools and open teaching in "Mechanical Theory"course[2]. Jiang Fan, et al study the TRIZ theory application in "Mechanical Theory" experimental teaching management[3]. Zhu Yu introduces CDIO concept to " Mechanical Theory Curriculum Design " teaching[4]. But there is no use of CDIO to optimize the " Mechanical Theory "knowledge points, to design driven project for the teaching and research.

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Based on "CDIO project-driven"concept, according to the principle of knowledge redundancy reduction, the kinematics, dynamics in "Theoretical Mechanics" are conbined with the knowledge points in "Mechanical Theory", and arranging the order of knowledge points teaching for the project implementation process, "Analysis and Design of Mechanisms" based on CDIO course is created, and show teaching progress, and students' learning results. This case could provide a reference for teaching reform of the CDIO courses in other colleges and universities.

2 Knowledge Points Optimization of "Analysis and Design of Mechanisms"

CDIO engineering education concept emphasized practical driving teaching [5-7], practice time is larger than theoretical teaching time, in order to save teaching time, the phenomenon of knowledge repetition in traditional mechanical teaching system need be optimized, to eliminate redundancy of major knowledge points.

In the traditional mechanical teaching, kinematics and dynamics are in "Theoretical Mechanics"course, when taught these knowledge points, the students do not have the application object, do not know what is the use of knowledge learned, and these knowledge points in the "Mechanical Theory"course appears again. In the "Mechanical Theory", the knowledge has a specific objects, students learn to feel it more specific, easier to understand these knowledge points. After integration, the knowledge points in "Analysis and Design of Mechanisms"course are shown in Table 1. The optimization principles of "Analysis and Design of Mechanisms" knowledge points are: (1) comprehensive the rigid body kinematics and dynamics in "Theoretical Mechanics" (the particle kinematics, dynamics are overlapped the knowledge in physics, no longer appear in this course), all the knowledge points in "Mechanical Theory". (2) preparation of textbook would cover the comprehensive knowledge points, teachers only teach important and difficult in the actual teaching, the rests are arranged after class for the students to learn through practical projects. (3) the order of knowledge points is adjusted according to the driven project.

Table 1. Knowledge points in "Analysis and Design of Mechanisms"

Chapter	Knowledge points
1 Mechanisms status, type and function of mechanisms	1.1 Mechanism design, research and development; 1.2 Basic component of mechanisms; 1.3 Type and function of mechanisms
2 Design examples of mechanical motion	2.1 Steps of design of mechanical motion; 2.2 Determine of mechanical action principle and the technology process; 2.3 Choose of the type and parameters of motors; 2.4 Selection of the implementing mechanisms, combined and mutation; 2.5 Comparison and optimization of mechanical motion scheme
3 Structure analysis of mechanisms	3.1 Procedures for drawing the kinematic diagram of a mechanism; 3.2 Degree of freedom of a mechanism; 3.3Points for attention during the calculation of DOF; 4.3 DOF analysis practice
4 Kinematic analysis of mechanisms	4.1Plane kinematics of rigid body; 4.2Kinematics analysis, research, and practice of mechanisms
5 Dynamic analysis of mechanisms	5.1 The force of mechanisms in the running process; 2 The relationship between mechanisms quality and its movement of mechanical components (Balanceing of machinery); 5.3 Mechanical efficiency and self-locking
6 Motion of mechanical systems ans its regulation	6.1Motion equation and its solution of a mechanical system; 6.2 Periodic speed fluctuation and tis regulation; 6.3Introduction to aperiodic speed fluctuation and its regulation
7 Design of planar linkage mechanisms	7.1 Characteristics of planar linkage mechanisms; 7.2 The types of four-bar linkages; 7.3 Characteristics analysis of four-bar linkages; 7.4 Dimensional synthesis of four-bar linkages
8 Cam mechanisms	8.1 Characteristics and classification of cam mechanisms; 8.2 Follower motion curves; 8.3 Plate cam with translating roller follower
9 Gear tranis	9.1Gear parameters; 9.2Gear trains and their classification; 9.3Train ratio calculation (includes fixed axes gear train and epicyclic gear train)
10 Mechanisms synthesizing	10.1 Creative thinking and creative methods; 10.2 Parameters optimization of mechanisms; 10.3 Examples of mechanisms synthesizing

3 Teaching Driven by Projects

Driven project design is a key factor for success CDIO engineering education, driving project design requirement is to make the students learn as much as possible the knowledge point of the course in the practice. There are lots of knowledge points in "Analysis and Design of Mechanisms"course, it more difficult to cover so much knowledge points with a project, so a number of projects are designed to students learn more knowledge points. a third-degree project is designed for students learn the main knowledge pionts, and the two sub-projects to strengthen the

rests of the knowledge points and practical ability, the driven projects are shown in Figure 1. The driven projects have a certain influence to the order of knowledge teaching, so we have to consider the progressive sequence of learning design-driven projects in addition to consider courses knowledge points as much as possible. In process of designing the driven projects, TRIZ theory could be used to solve the complicated problems.

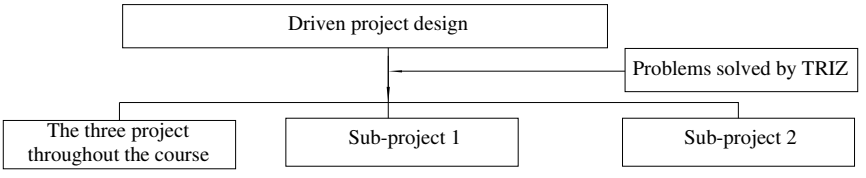

Fig. 1. The model of driven projects

The driven projects are designed shown in Table 2, which are running in Department of Mechanical and Electrical Engineering of Guangzhou University.

Table 2. Driven projects of "Analysis and Design of Mechanisms"course

Project name	Project contents
Design and manufacture of carbon-free car	Design a car whose moving device is driven by gravitational potential energy. This car is required structures with three wheels (a steering wheel, 2 driven wheels), the specific structural form and materials choose are completed by self-design of students.
Sub-project 1: Analysis of actual mechanism	Mechanism analysis of internal combustion engine; gear train analysis of transmission (manual transmission, automatic transmission)
Sub-project 2: Proposition mechanism design	Design the automatic stripping beans machine After soaking the dry beans, the beans is arranged head linked to tail by vibration, send beans to the location for cutting cover, the beans is pressed and cut the head covers, then squeeze the beans out of its covers.

4 Organization and Results of Teaching

Teaching about "Analysis and Design of Mechanisms"course is designed to: (1) teaching schedule is given to students three weeks in advance (including the teaching of knowledge points information each time, the driven project, after-school practice, etc.), and ask students strictly for compliance according to that teaching schedule; (2) the main practice of driven projects are done in the after-school time; (3) class arrangement: a) students teams report practice results of doing after school, as form of PPT and in-kind to explain and answer the question of the other teams; b) a teachers teach typical knowledge points, mainly teach the key and

difficult knowledge points, and answer the problems found from students in the after-school practice; c) seminar, organizes a in-depth discussion for the difficult knowledge points, each team summed up the discussion results respectively; d) after-school practice.

Using CDIO mode to organize the teaching process, students participate actively, learning enthusiasm is higher, consciously put into the project practice, the more understanding of the knowledge points, and learn better. Figure 2 shows part of the teaching process and learning results.

(a) report

(b) discussion

(c) practice

(d) product

Fig. 2. The teaching process and learning results

5 Conclusions

This paper discusses the principles of integration and optimization of knowledge points in "Analysis and Design of Mechanisms" based on CDIO conception, and the knowledge points optimized content, the model about driven project is established, the teaching organization mode is introduced, and shows the process of teaching and learning effect. These results could provide a reference for CDIO education reform in other university.

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The Creation and Connotation of Seven Equations in "A+T·CDIO" Engineering Teaching Reform

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Abstract. CDIO has been proved to be an effective method in engineering teaching of Aerospace, electronics, machinery, chemical, civil engineering, from which originates the engineering teaching reform in CDIO mode. However, the application of this mode in architectonics is still in doubt. The college of architectonics and engineering, NIT has made a trial experiment in this aspect by providing students with a whole industry chain environment under the CDIO mode. Seven equations are creatively designed by the concept and theory of A+T·CDIO, three of which are concerned with educational theory while four of which with implementation and operating mode of the former three. With the seven equations as the leading principle, the CDIO mode has been successfully applied to the education of architectonics, thus forming a characteristic teaching approach. The thesis introduces the seven equations, wishing to inspire those interested in the relevant issues.

Keywords: A+T·CDIO, Introductory course, Entrepreneur practical course, Project planning course, Graduation practice and designing instruction, Operating mode.

1 Three Equations Concerning Educational Theory

1.1 Discipline Professionals' Knowledge Structure Mode

- ***Equation.***

$$A+T=\text{art}\cdot\text{humanity} + \text{technology}\cdot\text{science} \quad (1)$$

- ***Connotation.*** A+T = Art + Technology, means the blending of art and technology, referring to the teaching environment of architectonics and knowledge structure of students majoring in architectonics.
- ***Interpretation.*** Architectonics is not pure science or art but rather a blending subject, therefore the education of architectonics should stick to the principle of an integration of art and science. The former impresses and the latter convinces. A qualified architectural design talents combine both the imagination

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and passion from the artists and sense and logic from a scientist. The talent training scheme should conform to the principle of an integration of art and science, cultivating students in both art and engineering.

1.2 Professional Disciplines Core Ability Structure Mode

- ***Equation.***

$$C{\cdot}D+I{\cdot}O= \text{Conceive}{\cdot}\text{Design} + \text{Implement}{\cdot}\text{Operate} \quad (2)$$

- ***Connotation.*** Conceive·Design emphasizes the creativity of students and Implement·Operate emphasizes the practical ability of students.
- ***Interpretation.*** CDIO is an advanced mode in engineering education, which is used to train qualified engineers. Though it has a short history, yet its application proves its validity and vividness. We introduces the mode to the education of architectonics, which highlights both the architecture professional talent training means, also showed the ability of architectural professionals structural features.

  There are two phases in designing and building a architecture: the 1st phase: to Conceive and Design; the 2nd phase: to implement and operate, these two phases are summarized as "Gen hold simultaneously", the 1st phase is characteristic of creativity and the 2nd execution, which satisfies the practical demands of an architect.

1.3 Professional Disciplines Talent Training Mode

- ***Equation.***

$$A+T{\cdot}CDIO=\text{integration of art and science}{\cdot}\text{Gen hold simultaneously} \quad (3)$$

- ***Connotation.*** discipline professionals knowledge structure sticks to the principle of integration of art and science while ability structure the principle of Gen hold simultaneously.
- ***Interpretation.*** As a classic mode in engineering education, CDIO is applicable to all engineering education, but to that of peculiar characteristics, optional modules should be added to the CDIO mode. Architectonics is typical of both engineering and art, therefore, engineering practice should be combined with artistic creation and imagination. Years ago, Architectonics education is a major in the college of arts, among which the most reputed one is College of Art in Paris, which is the forefather of academic school in Architectonics education. With the development of the society, the technical traits of Architectonics education are highlighted, as a result of which, the engineering schools become the major force in the Architectonics education. Nevertheless, the artistic traits of Architectonics education can never be ignored. The

CDIO mode can only meet part of the demands from Architectonics education, and an additional professionals knowledge structure and ability structure should be added to the CDIO mode. We put forward the concept of integration of art and science and Gen hold simultaneously, thus forming the A+T·CDIO mode.

2 Four Equations Concerning the Implementation and Operating Mode of the Educational Theory

2.1 The Organizing Pattern of Introductory Course

- ***Equation.***

  1+1+1+1=one orientation course+one introductory course+one recognition practice+one experiential contest (4)

- ***Connotation.***

- *One orientation course* - to orient students to the objective of the major and motivates students.
- *One introductory course* - to introduce the research field and up-to-date achievement of the major.
- *One recognition practice* - to acquaint students with the working environment and application field of the major.
- *One experiential contest* - to experience the competitive atmosphere in the design and implementation of engineering projects.

- ***Interpretation.*** By five courses, freshmen are familiar with the studying environment and know what they are going to learn and do, shifting from the learning style they have in middle schools to get accustomed to the new learning environment by an efficient learning way, therefore the students can be confident in their future study and realize their full potential.

2.2 Entrepreneur Practical Course Setting Pattern

- ***Equation.***

  28in4 + 1 = 28 progressive practice projects in four years + one year's practice in designing institute (5)

- ***Connotation.***

- *28in4* – 28 progressive practice project courses compose the curriculum of architectonics in NIT, these courses are through the eight semesters of four years' study, each course covers the practice in enterprises or designing institutes.
- *1* – one year for the architect business practice (pre-work practice) + graduation design course

- ***Interpretation.*** "Knowledge starts with practice" is the tenet that we believe. The organizing pattern of "28in4+1=4" enables students to have so long a practice of two years in enterprises, nearly 880 hours. According to architectonics' studying calendar, the practice course accounts for 40% of overall time. This pattern makes sure that students acquire adequate engineering training and engineering experiences. When graduating from NIT, students have a considerable amount of working experience in engineering, which is welcomed by employers. The training of the students majoring in architectonics is tailored to the requirements from market and business. Most students are capable of selecting enterprise to practice, only a few students need the help and recommendation of the college. The practice in enterprises is therefore associated with the employment. One year's practice in enterprises is equal to pre-employment, meanwhile, the architect business practice (pre-work practice) and graduation design course are carried out.

2.3 Project Planning Course Teaching Mode

- ***Equation.***

1+2+3+4=one goal+two "based on"+three unifications+four bi-modes (6)

- ***Connotation.***

- *One goal:* to train qualified backup architects approved by the business and market
- *Two "based on":* based on the requirements of the business and market, the teaching meets the requirement of the employer; based on the theory of project teaching method, which is the leading teaching approach.
- *Three unifications:* a unified teaching plan in core theoretical course, which underlines the integration of art and science, while the practical course emphasizes the "gen-hold simultaneously"; a unified curriculum resources for teaching plan, syllabus, project task document, teaching materials, extensive reading materials, question bank, example works; a unified teaching approach——for both teachers and students.
- *Four bi-modes:* a bi-channel of theory and practice which is required by the teaching of core courses; a bi-supervisor of school and enterprises which is assigned by both school and enterprises in practical course; a bi-teaching sites in both labs and enterprises for practical courses; a bi-subjects: the teacher as the teaching subject and students learning subject.

- ***Interpretation.*** The organization of the project designing course is essential to the students to acquire core knowledge and core ability. The project planning course teaching mode of "1234" satisfies the common demands and interests from the country, society, enterprises, business, school, teachers, students and their family, the teaching mode meets the requirements of training

qualified backup architects approved by the business and market. The unified curriculum and teaching approach are systematic, logical, reasonable and scientific. The four bi-mode training methods and modes can make full use of the advantage of both the school and business, as well as the strong points of the teachers.

2.4 Graduation Practice and Designing Instruction Mode

- ***Equation.***

  4+3+2+1=four emphasizes + three procedure controls + two achievements conversions + one branding (7)

- ***Connotation.***

- *Four emphases:* preparation, topic selection, creation and standardization
- *Three controls:* control the procedure of graduation design, the key phases in graduation design and thesis presentation
- *Two promotes:* promote the conversions of achievements and promote the acknowledging rate among the achievements.
- *One branding:* to build up a brand for the major construction

- ***Interpretation.*** The graduation design instruction is the most important and effective part of college education, a proper organization and implementation of which will lead to an improved quality of students' graduation design, which is deeply demonstrated in the comprehensive ability of students to analyze and solve the actual problems concerning both engineering and economy and society. Consequently an effective and efficient way to handle the graduation phase in college education is a must. The 4321 graduation practice and designing instruction mode, after years of trial run, has been proved to be an effective way to improve the quality of graduation design and inspire the students in their gradation creation.

3 Conclusions

The seven equations concern the most essential part in education reform of artistic engineering majors such as architectonics based on the CDIO mode, in which the "A+T·CDIO" is the core concept. Under the "A+T" conditions, CD and IO, as two core abilities, are emphasized, completely in line with the requirements from the market and business. The last four equations are the implementation for the first three. The five ones mode is to acquaint students with the working environment when entering the college; the 28in4+1mode enables students to acquire not only knowledge but also accumulate the working experiences; the 1234 mode helps students to get involved in a learning environment connecting both school and business, teachers and external supervisors; 4321 mode perfectly associates what

students have learned in college with what they need to do in graduation design and graduation practice. As a result, the full use of theses seven equations will help college teachers to provide our students with a whole industry chain environment under the A+T·CDIO mode.

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The Study on Constructing the Teaching System of the Generic Cabling Course for the Intelligent Building Major

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Abstract. Generic cabling system is the infrastructure facilities or highway in the intelligent building, it in the whole intelligent building system plays a role of the bridge and tie, and organically connects other subsystems of the intelligent building system together. Similarly, the intelligent building generic cabling course is also a main course of the intelligent building major. Based on the characteristics of the intelligent building generic cabling system, this paper puts forward the principles of constructing the teaching system of the intelligent building generic cabling course, presents the main contents of the course system, and provides the teaching method in use. So, it has certain reference value to improve the teaching effect of the intelligent building generic cabling course.

Keywords: Intelligent building, Generic cabling system, Course teaching system, Construction principles, Teaching method.

1 Introduction

As an integrated system, the intelligent building (IB) includes the building automation system (BAS), the communication automation system (CAS), the office automation system (OAS) and the generic cabling system (GCS). The composition of the intelligent building is shown as Fig. 1. In these subsystems, the generic cabling system plays a role of the bridge and tie, which makes other subsystems and building be integrated together to become an intelligent building system. In other words, it is the infrastructure or the highway in the intelligent building. Therefore, the generic cabling system plays an extremely important role in the intelligent building.

The intelligent building generic cabling course is one of the main courses for the intelligent building major. The intelligent building industry itself in China is still in the continuous development, and as the intelligent building major to dispatch the professional personnel for the intelligent building industry is still in its

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infancy, or at least is still not mature. Therefore, for the teaching of the intelligent building generic cabling course in China, it is basically no certain patterns. Although the related majors in some colleges has carried out some meaningful explorations about the course teaching. But it is obvious about the many teaching link of the course that they all are lack of the consistent and scientific settings.

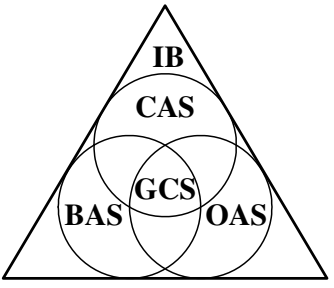

Fig. 1. The composition of the intelligent building

In the current society, the requirements to the quality, especially the practice ability and innovation ability of the talented person are higher and higher. How to cultivate the talents with the high quality and innovative ability has become an important symbol of the success to the higher education. It needs to carry out optimizing all links of the teaching, and continuous improvement. For the intelligent building generic cabling course, the first is to construct a reasonable teaching system, and continuously implement the improvement and development. It is the primary task in the teaching of the current intelligent building generic cabling course.

2 The Principles of Constructing the Course Teaching System

According to the characteristics of the intelligent building major, it should follow the following principles for constructing the teaching system of the intelligent building generic cabling course.

2.1 The Subjectivity Principles of the Students

The modern education and innovative talents need to fully develop the individuality of the students, arouse their subject consciousness, and cultivate sound character and innovation ability of the students. In the knowledge acquisition process of the students, they are not the passive and negative knowledge receiver, but the active and positive knowledge inquirers. So the teachers in the teaching concept should establish the modern education thoughts of taking the students as the subject, respect their characters, and use the advanced teaching content and methods. The teachers in the teaching methods should change the control into the coordination, and turn the scold into the incentive. Meanwhile, they should also strengthen

the intuition and vividness of the teaching content, carry out the teaching from the superficial to the deep trough making the difficult contents simple and making the abstracts concrete, and make the students start their own research and observation under the guidance of the teachers, apply the theory to the practice, and promote the practice into the theory. So it can greatly exert the subjective initiative of the students, and better inspire the learning enthusiasm and the desire to rediscover. Therefore, it is necessary to reform the teaching means to in the real sense meet the needs to train the innovative talents.

2.2 The Systematization Principles

Intelligent building generic cabling course itself has the complete system, and its content involves many aspects. But in the today's teaching reform, the class hour amount of single course is totally tended to be reduced. It requests the teachers in limited teaching time should pay attention to the systematization of the knowledge; the teaching content should be a gradient from simple to complex, be increasingly accumulated and deepened, and be paid attention to the combination of the theory and practice. Therefore, in the teaching, we set up two aspects of contents, including the intelligent building GCS design and intelligent building GCS construction and detection, in order to make the students systematically master the knowledge of intelligent building GCS.

2.3 The Integrity Principle

The intelligent building generic cabling is a boundary crossing discipline. It involves the computer technology, network technology, the communication technology, etc., and meanwhile it also relates to the building discipline. Therefore, the teaching process should pay attention to the integrity of the discipline. For example, in the teaching design, it should firstly arrange some foundation knowledge including the cable transmission system, optical transmission system, electrical protection technology, etc., and further arrange each subsystem design of the intelligent building GCS; Meanwhile, in consideration of the requirements of the actual project, the GCS engineering drawing design also is appended to the teaching content. All of these teaching contents fully consider the integrity of the course system.

2.4 The Practicality Principle

For the students of studying the intelligent building major, the work they will do includes the planning, the design, the construction, the management and maintenance of the intelligent building. Therefore, in the design and organization of the teaching content, it must closely combine the professional characteristics, and fully consider the practicality principles. For example, in the intelligent building GCS course, when explaining the common materials and products of using in the GCS project, it should emphatically tell the students about how to choose the

common materials and products, and just simply introduce the working principle of these materials and products. The reason of the teaching design is to pay attention to the correct use and maintenance of the products, rather than the research and development of the products.

3 The Main Content of the Course Teaching System

According to the above principles, the intelligent building GCS course system can be decomposed into two courses: one is the intelligent building GCS design, which includes 32 hours and a week of the course design; another is intelligent building GCS construction and detection, which includes 32 hours. The teaching forms mainly have the theory class and experiment class.

The intelligent building GCS design course takes intelligent building GCS as the research object, demands to know the composition and working principle of generic cabling system, and grasps the planning and design of each subsystem. The main course contents are shown as Table 1.

Table 1. Course content of GCS design

Content of course	Hours
Overview of GCS	2
The introduction and selection of GCS products	2
Cable transmission characteristics	2
Optical cable transmission system	2
Electrical protection technology	2
Engineering design principle of GCS	2
Work area subsystem design	3
Horizontal subsystem design	4
Riser backbone subsystem design	4
Design of equipment subsystem and administration subsystem	4
Campus subsystem design	3
Drawing design	2

[k] It still includes a week of curriculum design.

The intelligent building GCS construction and detection also takes the intelligent building GCS as the research object, demands to know and master the GCS construction process, and the principle and method of the system testing. The main course contents are shown as Table 2.

Table 2. Course content of GCS construction and detection

Content of course	Hours
Cable transmission channel construction	4
Optical transmission channel construction	4
Cable transmission channels testing	4
Optical transmission channels testing	4
Course experiment sections	16

The practice teaching is an indispensable part of the teaching process, it and theoretical teaching each other is complement, and both are irreplaceable. The intelligent building generic cabling is an interdisciplinary subject, and it involves many aspects with the strong practicality. Therefore, the two courses all arrange the practice teaching, which respectively are a week of course design and 16 hours of experiment; In addition, there are more practical teaching links, such as the on-the-spot visit.

4 The Teaching Methods of the Intelligent Building GCS Course

To cultivate the innovative ability of the students, improve the teaching level and education quality, based on the full study for the course contents and teaching regularity of intelligent building GCS course, the course teaching process uses a variety of teaching methods.

4.1 Adopting the Modern Teaching Technology

The teaching activity is implemented by a certain technology and equipment. The concrete process, organization mode and teaching effects of teaching activities are closely related to the equipment used in the teaching activities. Along with the unceasing development and fusion of the computer technology, network technology and multimedia technology, the modern teaching technology based on the modern information technology begins to emerge, it effectively breaks the limitation of classroom teaching, makes up for some defects such as the monotonousness and abstract of the teaching contents, improves the learning initiative of the students, and enhances the interactivity between the students and the teachers.

Through elaborately organizing the teaching content and well handling the difficulty and emphasis of the teaching, the multimedia courseware can be convenient for the autonomous learning of the students. Using the multimedia courseware to show the abstract knowledge, or using the video and animation to demonstrate the more complex concepts, standards, cabling products, and the process of the engineering construction and testing, it is helpful to more intuitively understand and master the course contents for the students. After class, through

the teaching website, the teachers can carry out interactive communication with the students, and answer the problems of students.

4.2 Adopting the Field Teaching Mode

In order to make the students deeply grasp the GCS structure, fully understand the working principle of the GCS, and completely know the cable routing and connection mode of the GCS, the teachers in the course teaching can adopt the teaching mode of the on-the-spot visit to carry out the field teaching explaining. The teaching mode can make the students achieve the scene perception of each GCS subsystem, clearly understand the actual operation of each GCS subsystem, and completely grasp the GCS structure. And the field teaching has a variety of the organization modes, such as the decentralized teaching, the centralized teaching, or the combination of both. In the centralized field teaching, the teaching atmosphere is more active, and can promote the interactive communication between the students and the teachers. The decentralized teaching cannot only cultivate the ability of the independent thinking, understanding, and learning, but also promote the cultivation of the students' social skills.

4.3 Adopting the Demonstration Teaching Mode

The teaching process is in a sense a demonstration process. All the words and deeds, teaching attitude, thinking method, and working method of the teachers have a certain demonstration function, and can profoundly influence the students. In the teaching activities, the teachers can fully utilize it. For example, when introducing the cables, connectors, and information module, the teachers can demonstrate the installation and testing of these equipments, and meanwhile explain these equipments. Through the demonstration teaching, it can promote the understanding of the students, and fully mobilize the subjective initiative of the students to make them solidly master the knowledge.

5 Conclusions

The intelligent building industry itself in China is still in the continuous development, and the intelligent building major is also in its infancy, or at least is still not mature. So it is necessary to insist the teaching reform and practice, and unceasingly optimize the training program of the intelligent building major. The generic cabling system in the intelligent buildings is the bridge and tie of other subsystems, and similarly, the GCS course is also the bridge and tie of other courses in the intelligent building major. So, through constructing the teaching system of GCS course, it also can drive the reform of other courses for the intelligent building major. In this sense, this paper can also make a certain contribution to further promote the teaching quality of the intelligent building major.

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Multimedia Technology Applied to College Ideological and Political Theory Course Teaching Problems and Countermeasures

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Abstract. Currently, with modern education technology as the foundation of multimedia technology has been used widely in the university thought politics theory class teaching. Through research, this paper suggests that the ideological and political education theory class teacher for the application of multimedia technology in education ideas couldn't keep up with the demands of the development of times; multimedia technology application level of knowledge is very deficient. Ideological and political education theory class teacher exist over-reliance on multimedia and other modern education technology phenomenon, teachers in making multimedia courseware aspect exists many problems. Modern education technology development of different universities problem of unbalanced In addition, the article about the existing problems were analyzed in detail and puts forward relevant Suggestions and measures. The multimedia technology in the application of college ideological and political course to further study political education courses teaching reform will play a positive role.

Keywords: Multimedia technology, ollege political education courses, roblems countermeasures.

1 Introduction

Along with the computer and other modern education technology rapid development and maturity, on the computer can realize many traditional simulative digital video, audio, and makes the image, animation and graphical text together in a computer for processing. Multimedia technology applied to college ideological and political theory course teaching complies with the college ideological and political course reform trend. Ideological and political education course is the ideological and political education of college students; the main channel of contemporary college students affected our country's value orientation. At present, along with the national education funds in universities, the growing importance of ideological and political education theory, most colleges and universities to strengthen political education courses teaching are equipped with modern education technology related hardware facilities, such as tape recorders, projectors, overhead projector, megaphone, slides, TV, computer, such as electronic equipments. For the

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multimedia technology in the ideological and political education theory course application provides the necessary condition and infrastructure. Multimedia technology is based on the modern education technology as the foundation of the modern teaching means, in the ideological and political education theory class teaching is the widely application of teaching effect improve to have the important meaning. The multimedia technology in the college ideological and political course application has changed the traditional teaching mode, improve the classroom teaching environment, stimulate the student's study enthusiasm and teachers' teaching enthusiasm, enrich the teaching means and forms, improve the teaching effect. Multimedia technology applied to college ideological and political theory course teaching to bring the beneficial aspects, but also with brought some unavoidable issue.

2 Multimedia Technology Applied to College Ideological and Political Theory Course Teaching Problems and Countermeasures

2.1 Teacher Couldn't Keep up with the Demands of the Development of Times, Multimedia Technology Application Level of Knowledge Is Very Deficient

2.1.1 Problem Introduction

Age requires the university thought politics theory class teachers' active use of multimedia and other modern education techniques for teaching, but in fact it is teachers' ideas is still relatively conservative and is relatively backward. Can not from the true significance of the multimedia and other modern education up understanding technical mean the status and role? Multimedia technology is to use computer integrated processing text, graphics, image, and animation, audio, video and so on many kinds of media information technology. Here will inevitably involve multimedia technology integration problems, integration is refers to a system that each element of the whole coordination, mutual penetration, make the system elements to maximize efficiency. The integration of information technology with curriculum is interdisciplinary teaching, the effective use of information technology and to enhance the education quality and learning effect. In this process, information acquisition, storage, processing and transmission are multimedia technology to solve the important problem of all these need to be the teacher has higher computer application ability. In other words, modern multimedia education technology application needs the university thought politics theory class teacher have basic computer application knowledge and application ability. But the reality is that the university thought politics theory class teacher the majority is liberal arts background, multimedia and other modern education technology capability is not strong, for computer expertise relative lack.

2.1.2 Countermeasures and Suggestions

First, change ideological and political education theory class teacher for the application of multimedia and other modern education technology in education of traditional concepts and ideas. Strengthening ideological guidance, change the idea is to enhance the education of ideological and political theory course teaching effect of the important prerequisite and guarantee. In ideological and political lesson of multimedia teaching, and other modern education technology, teacher's idea plays a very important role, only the teachers can from the thought actually realized the application of multimedia teaching benefits and effect, recognize the application of multimedia and other modern education technology in education can not only change university political education courses teaching environment, and still can steadily rising-a college ideological and political course teaching effect. Only in this way can we solved fundamentally teachers in action backward problem. Secondly, the universities' ideological and political education regularly theory class teacher applied modern education technology of multimedia related training. Multimedia and other modern education technology application ability training is to improve the ideological and political theory course teachers multimedia technology application ability of important ways. The universities' ideological and political education theory class teacher use of multimedia and other modern education technology ability training can be arranged in during winter and summer vacation, so you can avoid influencing teachers teaching work. Through training enhances the thought politics theory class teacher modern multimedia education technology application ability. On the one hand, the modern education technology ability education contents into the teacher continuing education courses and teachers to master the situation about the examination. On the other hand, we should strengthen the policy orientation of modern education technology capability and level as a teacher evaluation, selection of outstanding teachers and teachers, duties engaging and promotion the prerequisite, as an important examination conditions. Through training, the vast majority of college ideological and political theory course teachers college ideological and political theory course teacher can use the computer multi-media technology in education.

2.2 Ideological and Political Education Theory Class Teacher Exist Over-Reliance on Multimedia and Other Modern Education Technology Phenomenon, Teachers in Making Multimedia Courseware Aspect Exists Many Problems

2.2.1 Problem Introduction

The multimedia technology in the ideological and political education theory course application of improving the traditional teaching mode, improve the classroom teaching environment, stimulate the student's study enthusiasm and teachers' teaching enthusiasm, enrich the teaching means and forms, improve the ideological and political education theory course teaching effect. But also have many ideological and political education theory class teachers overly dependent on multimedia

teaching, anyone who comes to class to use multi-media teaching. The teacher left leads to many multimedia cannot normal lectures. In fact, multimedia teaching means is only as teaching auxiliary methods and cannot be used as main means. DaiJun in "multimedia technology application in classroom teaching problems and Suggestions" paper pointed out that "auxiliary multimedia classroom teaching, indeed have discipline traditional teaching method incomparable advantage, but this does not mean to the traditional teaching method of rejection, more do not replace traditional teaching method. But in the teaching practice, some teachers overstating the multimedia effect, the multimedia assisted teaching into technical operation demo lessons on, from one extreme to the other extreme." [1] I'm gradually getting used in addition, in multimedia courseware also have many problems, multimedia courseware aggravating the teacher's workload, partial teachers make teaching courseware b-movie, make repeat, and even a few teachers simply from online under some someone else did the courseware for teaching with directly bring them here. LiuYanRong in "2000c multimedia teaching advantages and disadvantages of" a culture that said "because of multimedia teaching all USES multimedia courseware, and making multimedia courseware requires a lot of words, pictures, video, animation, voice, the color and so on material, intangible between increased teacher prepares a quantity. In order to make teaching courseware colorful and vivid feeling person, the teacher will often from Internet, bookstore search of material and then finished a lot of text input, animation, etc. To deal with a courseware will often investment than mere ChuanTong class more time and energy lessons. Besides courseware necessary preparations job outside, the teacher must also to the classroom every link of completes the elaborate design. Visible, compared with traditional teaching methods, multimedia teaching of higher request more fine. Therefore, doing each new courseware's process, the teacher is often to the seams. In the long run, the teacher cannot afford to delve into teaching materials." [2] all of these problems can influence the modern education technology in the ideological and political education theory of application effect of play.

2.2.2 Countermeasures and Suggestions

First, lead teachers' moderate use of multimedia and other modern education technology in education. To correctly rational treat multimedia teaching, reasonable use of multimedia teaching. To the traditional teaching mode and combine the multimedia teaching model for ideological and political education of their teaching. Yan Min in "the multimedia technology in the political theory course of study" effective application a culture that said "politics theory class teaching, and not every class, every problem should use multimedia technology means, but wants fewer but better, according to the teaching contents in the need to choose a lot of media technology using time, let using technique can properly, effectively for teaching content service. If disregard the teaching content and follow one's inclination using multimedia technology, and its results will only is spread out the attention of students. Appropriate use of multimedia technology, ability with the minimum cost gets optimal teaching effect." [3]

Second, collective lessons, deploy high level teacher to excellent multimedia courseware, improve the quality of multimedia courseware. Strengthen between teachers, the school of communication between different universities, collect the best teacher multimedia courseware into education CD, and improve the level of multimedia courseware.

2.3 Differentuniversities Education Technology Development Modern Problem of Unbalanced

2.3.1 Problem Introduction

Because of higher education in different regions in the development of unbalanced, so in different parts of the modern education technology university in application are very different. The more developed eastern provinces because education funds have safeguarded so earlier the modern education technology achievements have been applied to teaching practice. But due to the economic development in the western region, resulting in higher education is comparatively backward of funding problems also more nervous. Many education funding couldn't carry out, the impact of the modern time in college education technology application. Now many colleges and universities in the western modern education technology equipment and facilities are relatively backward. Because funding couldn't get very good security, leading to the ideological and political education of university course arrangement of the multimedia classroom often cannot meet the requirements of teaching. Therefore, in the present situation, the western region most colleges and universities there are several classes together class even large class lessons. All of these have influenced the university thought politics theory class teaching effect of play. In addition, many places of college ideological and political education theory in the course, and be not taken seriously by comparing status of discrimination.

2.3.2 Countermeasures and Suggestions

First, strengthen ideological and political education funds investment, especially to the Midwest economic development in underdeveloped regions college proper tilt. The universities' ideological and political education give safeguard teaching facilities, teaching software development, teacher training funds.

Second, strengthen legislation; the universities' ideological and political education theory course teaching should implement special funds for policy. At present, education department has already issued relevant policies, rules of ideological and political education theory class teaching must ensure that funds 15-20 yuan supplies, however, in many colleges this part of funds and cannot be implemented. Therefore, strengthening the system legislation is college ideological and political education funds cogent safeguard was not misappropriate the necessary measures.

Avoid using footnotes.

3 Conclusion

Anyhow, the multimedia technology in the ideological and political education theory reflects the application of multimedia technology in teaching advantage. Its use to teacher's lessons and organize the teaching brought convenient, improve teaching efficiency, improve the teaching method and so on. But also cannot ignore its existing problems, the only way to make the multimedia technology in the college ideological and political course plays to maximize the effectiveness. The multimedia technology in the ideological and political education theory course application in-depth study is of positive theoretical significance and practical significance.

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Strategic Study of Improvement of Regional College Graduates' Employability

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Abstract. Regional college, responsible for the provision of trained personnel and technology for regional economy, is an important part of Chinese higher education system. The study starts with the connotation and the influencing factors of employability, applies for SWOT theory to analyse employability, and puts forward three strategies and four systems to improve the employability.

Keywords: Regional college, Graduates, Employability high school.

1 Introduction

Regional college is an important part of Chinese higher education system. In the process of the popularization and reform of higher education, regional college becomes the main forces of higher education, and the key element of regional innovation development and urbanization. It is responsible for the provision of trained personnel and technology for regional economy. In the face of grim employment situation, it is very meaningful to improve graduates' employability to deepen the teaching reform, stimulate the sustainable development of regional economy, and construct the harmonious society.

Chapter 1 Connotation and Influencing Factors of Employability

Employability refers to college graduates' ability to compete with others to obtain employment to realize their values, that is the ability to meet the requirement of employers and the society. Employability reflects the teaching quality of colleges and universities, and the values of employers and the society. The main influencing factors of employability:

Economic development and industrial structure adjustment are the main factors. Full employment, economic development, stable price,and international payment

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balance are four aims of governments' economic management. For a long time, Chinese economy has sustained a rapid growth, especially since the mid-term of 1990s, the growth of GDP has reached 7% every year. However, the employment growth is not coincident with economic growth. According to statistics, China annual GDP growth is 9% in the past twenty years. Between 1991 and 2001, annual employment growth is 1.1%, 7,520,000 per year, and cannot meet the requirement of new labour forces. Tertiary industry has much space for employment growth, so it is the main way to settle the graduates' employment problem. With a large scale, traditional industry cannot afford the growth of graduates' employment, but the tertiary industry, supported by high technology industry and modern service industry, is different from traditional industry. For example, Zhejiang province has attached great importance to tertiary industry in recent years, and has made an accomplishment in industrial structure adjustment and upgrading. The growth of tertiary industry has occupied 43% of GDP growth in 2010. The development of tertiary industry takes a lot of work forces from the first and secondary industry, and the rate of the employment of tertiary industry increases every year. However, the development of tertiary industry is lower than the global average of 2006, that is 69%.

The conflict between enrollment program and employment marketization is the systematic factor of college graduates' employment. Chinese higher education has moved from elite education to mass education. Obviously, the cultivation of elite is different from the cultivation of mass. College graduates' employment has entered the market since 1995, so it should follow the laws of human resource market. However, colleges and universities still follow the laws of a planned economy to enroll and cultivate, and the cultivation falls behind the market. Graduates cannot meet the requirement of society. Disciplines offered in a college are not suitable for the market requirement, which is the structural conflict of graduates' employment.

Deficiency of social equity is the systematic factor of college graduates' employment. According to certain report in 2008, 72.2% graduates are willing to go down to the grass-roots units. It shows that graduates' employment conception is changing. However, social resources concentrate on the city and the high level, the grass-roots units cannot get the deserved advantages, such as venture environment, growth opportunity, policy preference etc., so the employment of grass-roots units, which should be the main employment area, becomes college graduates' second choice. Many graduates are willing to work in the big cities, and have great enthusiasm to be civil servants, which lead to the phenomenon of "no employment" and "unwilling to be employed", even the phenomenon of disguised full employment.

2 Chapter 2 SWOT Analysis of Regional College Graduates' Employability

Strengths. Interpersonal relationship strengths. Regional colleges are directly managed by local government, and their growth depend on local government.

Certainly, they serve the local economy, and their education development promotes the economic development. Therefore, colleges are closely related with local enterprises and public institutions, and usually establish cooperative relationship with them. It is very beneficial for them to see the market's requirement, optimize the educational program, promote teaching reform, and improve graduates' employability.

Regional strength. Regional colleges are familiar with regional economic and social development, cultures and conventions, and educational requirement, so they can see the market's requirement exactly, and cultivate the market-oriented applied talents. They have many advantages to open up local market, to make market strategies, and to accommodate themselves to local economic and social development.

Base strength. College and enterprise cooperrative project, beneficial to enterprise, college and graduate, promotes employment base construction, teaching reform, and graduates' employability. Some foresight entrepreneurs are willing to establish cooperative relationship with regional colleges to build graduates' employment base because of enterprise development. Meanwhile, based on the cooperative relationship, enterprise prefers to employ regional college graduates. This contributes to regional college graduates' employment.

Weakness. Educational investment influences teaching quality. First, regional college is managed by local government. If local government doesn't give enough investment, college's teaching quality cannot be promoted. Besides, regional college doesn't have enough comprehensive strength, so it is difficult to bring in talents and enroll excellent students. All these influence teaching quality. Second, regionality limits graduates' employment space. Compared with provincial college, regional college doesn't have economical, cultural and information advantages. This limits regional college's development. Regional college graduates don't have enough advantages to compete with "985" and "2ll" college graduates, and are refused to be employed by some enterprises which deliberately boost graduates' qualification .

Opportunities. Hugh employment pressure caused by financial crisis urges government and society to give priority to settle the unemployment. The government has made some employment policies to facilitate the growth of employment, which gives graduates good employment environment.

Rapid economic growth. The government has proposed "sustain economic growth, expand domestic demand, and adjust industrial structure" economic development strategy since the explosion of financial crisis. Chinese economic growth sustained 8.7% and 10.3% in 2009 and 2010. With the implement of some important domestic demand expansion policies and the effects caused by these policies, Chinese national demand will go a further step to ensure the growth of employment. Especially some new industries will contribute to new economic growth and much employment space, and give graduates a better employment environment.

Threats. China will face a grim employment situation at present and even during the period of the twelfth five-year program. On one hand, the total amount of employment is huge, and work force supply is more than demand. On the other

hand, there are conflicts within work force market and between employment structure and industrial structure. External employment environment gives new requirements to adaptability and employability.

3 Chapter 3 Strategies to Improve Graduates' Employability

How to change graduates's comparative advantages to suatainable advantages? How to improve regional college graduates' employability?The study applies Micheal E. Porter's competitive advantage theory to propose three strategies and four systems to regional college graduates' employability.

Three Strategies. Differentiation strategy. Graduates are short of professional skills. Different levels of graduates usually apply for one position, and they don't have comparative advantages. Therefore, regional college should stick to applicablity principle and strength the relationship with enterprises, thus to obtain the market comparative advantages and differentiation advantages. In that way, it can avoid the competition with provincial college to take up secondary market, and get more employment opportunities. Cost-leadership strategy. Regional college graduates should plan their career earlier, make right career decision, understand their own advantages and disadvantages, and create more values for the enterprise. Graduates should not care too much about salary, but should pay attention to the development space provided by the position. High qualification with low salary can win competitive advantages to seize work opportunity. Focus strategy. Regional college should stick to the principle to serve the local area, and make great use of its advantages to cultivate applied talents. Besides, Disciplines and majors are in accordance with industrial links. In that way, talent cultivation can serve the development of regional economy, and graduates will win the advantages in the regional human resource market.

College support system. Determine college features and form characteristic principles and cultivation mode Burton R.Clark said, "the worst way of higher education is to put all the eggs into one basket. Higher education should avoid single mode". Regional college should make development strategies in consideration of flexible running mode, technique-emphasized cultivation mode and employment market. Compared with other types of colleges, it should form its own principles and win competitive advantages and differentiation advantages. Besides, it should make efforts on characteristic majors, important majors and competitive majors. According to the regional development of economy and society, it should accelerate the adjustment of discipline structure. emphasize entrepreneurial and employment guidance and perfect service guidance system. First, The college should attach importance to employment education. It should take employment guidance course into teaching plan, and build employment guidance mode through four-year study. Second, the college should improve employment information service system, build effective internet market, and found information platforms which provide employment guidance, employment management and employment service. Third, the college should pay attention to entrepreneurial education. It should set up excellent entrepreneurial policy system, service system and working system, found some entrepreneurial bases, organize entrepreneurial teams, and set

good examples for graduates. Fourth, the college should open up employment market that college market is a main part, standing market, regional market and industrial market are complementary parts. Strength professional education and improve graduates' professional qualification. The college should actively advance educational reform which focuses on the promotion of innovation spirit and practical ability, and professional education which focuses on the promotion of professional ability.

Graduates support system. Correct employment value. According to the employment situation, graduates should set up correct employment value that they take themselves as common labourers to participate in employment competition. Besides, they should adjust their wishful thinking in accordance with national economic development, political situation, employment policy, industry development prospect, position requirement, etc. They can choose to work in the grassroots units. Promote individual comprehensive qualification. Graduates' comprehensive qualification is the base of employability. Comprehensive qualification includes moral qualification, professional qualification, psychological qualification, technical ability, etc, and shows graduates' different abilities such as innovation ability, cooperative ability, knowledge mastery, value orientation etc. The promotion of comprehensive qualification needs knowledge learning and upgrading, practice training, and social ordeal. Mental preparation. Positive attitude is an important factor of the promotion of employability. Graduates should overcome psychological obstacles to build confidence. They can apply "primacy effect" theory to give good first impressions on others, apply "coexistence effect" theory to exchange information and make good cooperation, and apply "self-suggestion" theory to make self-adjustment and self-affirmation.

Society support system. Expand colleges' autonomous rights and promote educational industry mutual development. The government should improve the reform of college management, and give much more development space for higher education and employment requirement. Besides, it should protect colleges' juristal personality, support colleges' characteristic running and multiple development, and actually give their autonomous rights to make enrollment plan and other teaching affairs. Change economic growth mode and realize the growth both of economy and employment. Government should develop labour-intensive industry, service industry and small-scale enterprises, and make every attempt to expand employment market. Besides, it should implement positive financial policies to expand the investment of infrastructure and public service in less developed area and rural area, and break down the dual structure in urban and rural economy and the incompatible economic development between different regions. Because the development of middle-sized and small-sized enterprises are the main impetus of the growth of regional college graduates' employment, the government should support the development of middle-sized and small-sized enterprises to increase employment positions. Improve graduates' employment policy and build good employment environment.

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Application of Sports-Based Project Teaching Mode in Cultural Education for Athletes

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Abstract. Athletes' learning is influenced by internal factors, such as the level of cognitive development of students, achievement motivation and the corresponding personality characteristics, and external factors, such as teaching concept and curriculum concept. Constructivism which is the further development of cognitive theory and constructivism learning mode has made a profound impact on the teaching reform. So the mode of athletes' cultural teaching should be adapted to the trends of teaching reform and athletes' characters. By using the method of literature study and observation, this paper analyzes characteristics of athletes' learning style and theoretical basis of project teaching mode. Based on these this paper constructs a new sports-based teaching mode in athletes' cultural teaching.

1 Introduction

Scientific and cultural quality of athletes directly affects the sustainable development of competitive sports. With our in-depth development of sports and education, athletes' cultural education made great progress. However, due to the special groups of athletes, their cultural education is still the weak link in the development of athletes. Therefore, this article attempts to analyze factors affecting athletes' learning on the basis of their learning characters, and according to own practical experience, combined with the modern trend of teaching reform, present suitable teaching mode to promote the improvement of teaching quality for athletes.

2 Factors Influencing Athletes' Cultural Learning

Learning is a complex long-term acquisition process, and the learning effect is influenced by internal factors and external factors. Different from the ordinary, high-level athletes as a special group of students, their cultural learning process has its unique characteristics.

2.1 Cognitive Factors

A key factor affecting learning is cognitive structure, such as the level of cognitive development of students, achievement motivation and the corresponding personality characteristics.

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First, when Learners begin their new study, their existing level of knowledge and cognitive development is an important indicator of learning readiness, and is also the important factor affecting the follow-up study. In china, athletes have the particularity of their learning. Most athletes begin training in very early age, and training takes up much of their time. Therefore, the time for cultural learning is limited, which lead relatively poor cultural knowledge. Second, cognitive style is the individual's preference for the way of information processing, including the way of perception, attention, thinking, memory and problem-solving of the outside information. Chinese and foreign scholars classify the learning style into different categories. There are auditory, visual, kinesthetic and tactile (Reid, 1987). Athletes are typical kinesthetic learners. They tend to learn through touch and movement and change the perceived information into a whole body's movement. So in the Class athletes will more interest in the cognitive activities that they can participate in it. Third, achievement motivation in school contexts has cognitive driving force, self-improvement driving force and ancillary driving force. From the early age, athletes focus more on professional achievement than cultural learning, so their long-term absence and poor cultural level results that they cannot keep up with the normal teaching schedule, and then causes the fear of hardship in psychology and brings their resistance and weak motivation to cultural studies. But with the advancing of internationalization, the updating of talents' standards, every country gives more attention on athlete's cultural education and athletes become increasingly recognized the importance of cultural literacy and their learning motivation gradually transform from the ancillary driving force to self-improvement driving force and cognitive driving force.

2.2 External Factors

External factors are important factors affecting student learning. Relatively athlete has little study time, so in the limited time the teaching level and quality has a significant impact on athletes' learning effect. Now most class teaching still shows the following characteristics:

First, Knowledge-based teaching concept is an important factor. Influenced by rationalism, traditional classroom teaching mode and teaching methods emphasize the cognitive ability of students too much, while ignore the cultivation of students' emotion, attitudes and values. Traditional teaching mode emphasizes knowledge-based. This teaching mode is not conducive to stimulate enthusiasm of students, but also not conducive to cultivate students' practical skills. Second, curriculum concept is another important factor. Today, most schools' textbook for athletes are still widely used the same as the comprehensive school. These textbooks are reasonable, involve a wide variety of knowledge and adapt to students at all levels, but the content and presentation of material is not fit for the actual situation of athletes. In the classroom, teachers mainly take the content in the textbook as the teaching content. But textbook is not the only curriculum resource. Teachers need to change the curriculum concept from the limited materials to more practical materials.

From what has been discussed above, the internal factors and external factors have a direct impact on the athletes' cultural learning. Athletes as a special group, their differences are an objective phenomenon. So teaching mode should take targeted measures based on the objective differences to promote the development of all students of athletes.

3 Theoretical Basis of Project Teaching Mode

In recent decades, every country's education takes reform constantly. Large-scale education reforms are guided by a certain learning theory. Learning theory can be traced back to behaviorism's stimulus-response theory and cognitive learning theory. As psychologists have deepened the research on the rule of the human learning process in recent years, an important branch of learning theory, constructivism, is gaining popularity. Constructivism has made a profound impact on the teaching reform. The project teaching mode pioneered in McMaster University in Canada is based on this theory.

3.1 Constructivism Learning Theory

Constructivism theory assumes that the process of learning is not only a memory process but also a process understanding and constructing new knowledge on the basis of existing experience through communicating with the outside world. Therefore, "situation", "collaboration", "communication" and "construction of meaning" are the key four elements to learn. According to constructivism learning theory, students are the subject of learning, and students change from passive recipients of external stimulus into the main body of information processing; teachers change from initiator and inculcator of knowledge into designers, mentors and collaborators. First, teachers play the role of designers. They design teaching activities, create learning scenarios for students and let students take some innovative learning activities in a real environment. Secondly, teachers play the role of mentors and collaborators. They will guide students to study independently and cooperate with students to complete learning tasks in appropriate time, rather than simply imparting knowledge to learners in one-way process.

3.2 Constructivism Theory of Cognitive Tools

Theory of cognitive tools considers that thinking is the intermediaries of learning, so in order to more directly affect the learning process, it should reduce too much attention on transmission technology, and pay more concern about teaching technology about how to cultivate learners' thinking in different tasks. Cognitive tools are mental and counting devices to support, guide, and extend learner's thinking process. The former exists in the learner himself including the learner's internal cognitive, metacognitive strategies; the latter is external, including computer-based devices and the environment. According to theories of cognitive tools, making use of external cognitive tools can make learners' thinking activities

externalizing, and help teachers control and lead their advanced thinking; while rational design and use of external cognitive tools can activate cognitive and metacognitive strategies to promote reflective thinking.

The reform of our country's teaching mode is rightly based on the reform of learning theory. The traditional teaching model is teacher-centered, and students are passive recipients of knowledge imparted by teachers. In mid-eighties, China began the reform of teaching mode by the impact of constructivism learning theory. The reform of project teaching mode is mainly directed against the traditional teaching mode, emphasizes the guidance of teachers, and constructs a new student-centered and teacher-led teaching mode that take learners' development as main purpose.

4 Application of Sports-Based Project Teaching Mode in Cultural Teaching

For athletes, classroom teaching is an important method to improve cultural level. Student athletes have the dual task of learning and training, so improving their learning abilities through implementing classroom teaching and organizing a wealth of teaching activities is particularly important. Project teaching mode based on constructivism learning theory plays an active role in improving the quality of teachers' teaching and the abilities of students' learning. Project teaching mode that is based on course objectives take specific project tasks as learning purposes and the optimized learning resources as learning medium and the representation of learning production as evaluation tools. It is a teaching method through letting students apply learned knowledge and research new knowledge themselves to complete the project that teacher assigned, in order to make student acquire new knowledge and prompt students to practice. The implementation of the program will be shown as follows.

4.1 Project Design

The key point of implementing project teaching mode is choosing the appropriate research project. First, the selection of projects should be practical. Athletes enable find the association between the project and the learned course and experience. Second, the selection of projects should be educational. They should meet the developmental needs and interest of athletes. Moreover, the selection of projects should be challenging and instructive. The project can stimulate athletes' interest. So the projects for the athletes should be combined with features of professional characters of athletes. That is, the chosen project can be based on sports itself.

4.2 Implementation of the Project

The implementation of the project should be finished by several groups that can be divided in different situations. The groups take the special project as the

researching subject to learn and explore independently. The project team should make self-generated works and within the group practice and demonstrate works. It can be divided into following steps. First, project introduction. Before implementing the project, teacher taken as a designer should set up the correlative situation for students, and describe the project requirements. Second, group and work division. After determining the theme, students can form study groups or choose to complete individually according to their own interests and make sure the work division that every student should have and take different work. Third, materials' collection and collation. After the work division in a group, the students should collect and collate information and materials as many as possible through various ways. Forth, problem solving. Study group should determine problem-solving strategies and methods and begin implement the project. Students should collate, summarize, digest, absorb, and reprocessing the information and materials for further research. In this period, teachers should provide students with targeted advice and guidance and supervision.

4.3 Project Reporting and Evaluating

After project is completed, the study group should display the project's production to the whole class. The forms of final presentation can be various, for example, in text form, such as papers or reports, or the use of computer technology, such as slides, animation, or the use of debates, lectures, drama, and other diverse forms. Project evaluation should use multi-agent evaluation, such as student self-assessment, peer assessment, teacher assessment and so on. Evaluation process should be open.

For athletes' teaching, the project should be combined with the characteristics of the athletes. It can be designed based on sports. Sports-oriented teaching content can not only stimulate students' interest in learning, but also increase the relevant professional knowledge of sports.

5 Summary

Project teaching mode breaks through the traditional teaching's mode and methods. It stimulates the enthusiasm of students through reproducing some situation which players are familiar with and achieve mastery of the knowledge and two-way exchange through students' self-learning. In the whole process, it not only plays a leading role of teachers, but also shows the main role of students. In the context of contemporary education reform, athletes' cultural education should follow the trend of education reform, compromise the features of traditional teaching mode and project teaching mode and combine athletes' special learning features to optimize athletes' teaching mode and to truly improve the athletes' qualities.

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The Teaching Reform of the Course of Quality Management and Reliability

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Abstract. Quality management and reliability is one of the main courses of industrial engineering, practical and theoretical is stronger. According to the characteristics of curriculum and the latest development of subject, status and problems of the course are analyzed in this paper firstly. Then, we explore the aspects, such as the reform of teaching methods, teaching content innovation and practice teaching and evaluation methods and so on. In order to cultivate students' innovative practice ability and practical talents in quality management, we expound the heuristic teaching mode of the integration of the statistics and quality control and reliability, and the integration of the heuristic teaching and the case teaching, and the combining the practice teaching of the theory teaching in this paper.

Keywords: Quality management, Teaching reform, Teaching way, Heuristic teaching, Case teaching.

1 Introduction

The course of quality management and reliability is a professional course in industrial engineering, it is a course of the combination of management and technology and it is a strong practical curriculum. It not only requires students to master the theoretical knowledge of the course and any course-related professional knowledge, but also requires students to have a solid professional foundation, strong practical ability and statistical thinking. So as to enable students find these problems in production process and solve quality problems after graduation.

2 Status and Problems of the Course

Industrial engineering is an emerging multi-disciplinary of technology and management. Because the time of the IE development is short in our country, the curriculum system in all higher institutions is still not perfect, the teaching reform and practice of IE professional is a focus of the study. "Quality Management and Reliability" is one of the compulsory courses in IE professional, the quality of

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management theory, methods, systems, design and process quality control and reliability are elaborated in this course, and its purpose is to make students understand the theory of modern quality management, master these methods of statistical quality control and reliability design, and can make students apply their knowledge to analyze and solve the various quality problems appearing in production and management practices. Therefore, it is necessary to highlight specific and practical of the teaching goal, but also pay attention to the converge related to professional skills courses. Currently, the teaching quality of this course is well, but compared with other major colleges, there are still the following problems in our college.

Because of the teaching methods based on traditional teaching methods, the interaction between teacher and student is little, students are not enthusiastic with the course.

Practice is weak and a serious gap between theory and practice, the students' understanding of knowledge is not accurate enough, thinking and problem-solving ability is not strong.

Statistical thinking is not prominent and systematic is not strong in the course, so that students can not really appreciate the importance of statistical thinking in quality control.

For these reasons, the quality of teaching effectiveness of "Quality Management and Reliability" is not very prominent, in order to mobilize the enthusiasm of students and creativity, improve teaching quality and teaching effectiveness and cultivate more high-quality personnel, the research team still needs further reform.

The Teaching Reform of the Course

The characteristically of "Quality Management and Reliability" requires us to impart knowledge into students, but also focus on student ability, then how to cultivate the students creativity and practical ability? We carried out further exploration and reflection: the reform program mainly include the reform of teaching methods, teaching content innovation and practice teaching and so on.

Reform of Teaching Methods. Mainly traditional teaching methods include writing on the blackboard, questions, exercises and other teaching forms, the amount of information is small and teaching method is a single way. In order to mobilize the enthusiasm of the students and train students creative thinking and improve their analysis of issues and problem-solving skills, the research group develop reforming route which are the heuristic teaching mode of the integration of the statistics and quality control and reliability, and the integration of the heuristic teaching and the case teaching, and the combining the practice teaching of the theory teaching.

The integration of the heuristic teaching and the case teaching. Heuristic teaching include two methods of inspired by discussion and inspired by questions, through participation in classroom activities to inspire students to learn to analyze and solve problems, and achieve two-way interaction between students and teachers. For example, the teacher may trigger enthusiasm of the students in the process

of teaching through case and inspire students to think quality issues, and find generating source of the problem of quality, and guide students to use 5M1E methods including man, machines, materials, method, measurement and environment to find the main reasons of the problems. Of course, in the process of looking for reasons, students will use a huge amount of knowledge and data processing methods, after the main reason is confirmed, a series of improvements program are made, and then improved process are controlled and final improved results are inspected. This way of teaching students can mobilize the enthusiasm and interest in learning, but also to cultivate innovative thinking of students. The case teaching is achieved mainly through a typical case of quality management. For example, Haier Group's quality management and business model, 6 Sigma methods in the application of Xiamen ABB Group, if necessary, increasing the video teaching and guiding students to practice to consolidate and digest the knowledge.

The teaching method of the combination of traditional teaching methods and modern teaching technology. The trend of teaching methods is digital and network [1], Through the full use of existing educational resources which include multimedia, software applications, seminars, case teaching, online, classroom displays, the case teaching, the scenes teaching etc, the school provide a platform of communication and interaction between teachers and students to increase the vitality of classroom teaching, and play the advantages of both teaching and learning. Currently, we have made high-quality multimedia which can show the students a fresh experience. Through reform, the classroom atmosphere is active, student's interest in learning is enhanced and a significant teaching effect is made.

Innovative Teaching Content. The contents of quality management are rich and profound, so according to the characteristics of industrial engineering disciplines, the latest content should be added to maintain the advanced nature of disciplines in order to cultivate practical talents. At present, the features of the courses of the industrial engineering are hours less and content more, so the teaching content are focused. Innovative teaching content are in the following two aspects:

The integration of the statistics and quality control and reliability. Strengthen the statistical thinking in the "Quality Management and Reliability", and enhance the quality of student's data processing analysis. The experiments and curriculum design centered on the "statistical quality control" are set up in major colleges and universities, so the statistical thinking should be add to the curriculum. For example: the contents of probability statistics, parameter estimation, hypothesis testing, variance analysis and experimental design in statistics are widely used in quality control. The solution to the quality problem depends on the collection, collation and analysis for quality data in enterprise, the statistics is a subject about data collection, collation, display and analysis[2], so it is necessary to learn quality control and understand the statistical meaning. Therefore, in the teaching curriculum, the teacher remind students to preview the contents about statistics, such statistics thinking can be applied to solve real quality problems, and the students can understand the essence of probability and mathematical statistics. At the same time, the students can to master statistical software, such as SPSS, SAS, Minitab, etc. and analyze the quality data by statistical software to improve the ability to solve practical problems and the corresponding software skills.

The joint schools and business. Speaker teachers who have the business consulting services experience should apply them into teaching and make curriculum more practical operations, and draw some training contents for enterprises training from the theoretical teaching.

Strengthen Practice Teaching. Strengthen the practice teaching is the focus of developing innovative personnel system and an important way of improving the innovative spirit of students and practice ability[3]. the heuristic teaching mode that is the integration of the theory teaching and practice teaching is used in my school, in the traditional theory teaching course, the teachers encourage students to participate in academic lectures related to the quality management, and invite the experts of China Quality Association and quality management consultancy and business management to have extra-curricular lectures, and actively organize students to visit Tangshan Aisin Gear Group, CNR, school projects training center, and encourage students to participate in course-related research projects to train students the ability of independent analyzing problems, theoretical points of flexibility and innovation in problem-solving skills. Practice is enhanced mainly by the following three aspects:

The development and utilization of internal and external experts. Application of quality management is strong, it is necessary to employ quality management consulting organization or business management expert to come to the school to teaching. For example, the specific applications of quality management in the enterprise, process quality control and quality certification procedures, etc., only with the implementation in the enterprise, it can enable students to make a more thorough understanding and stimulate the enthusiasm of students.

Adding Additional curriculum design throughout the whole process of teaching and actively guiding the students to participate in research projects. Through the actual development and research activities, on the one hand to enhance understanding of boring, esoteric knowledge, at the same time broaden their horizons and improve the practical application ability. These works can lay a solid foundation of scientific research for students[4]. Range of curriculum should be broad, and the content should reflect the important and difficult knowledge points, and the course design topics are as follow.

A: Design Quality Control— The application of quality function deployment in the process of welding and reliability analysis. Teachers must provide students with welding process, and the composition of product components and their reliability data.

B: Manufacturing process quality control—how to improve the transmission qualified rate. Teachers must provide students with a detailed production process and quality data of transmission.

C: How to improve the quality of saw blade. Teachers must provide students with detailed production process and quality data.

Curriculum design should have extensive coverage, and enables students to digest what they have learned to enhance understanding for the quality management theory and technology.

Increasing openness and comprehensive experiment. The course requires students to have the practical ability and processing capabilities for quality data. Typical experiments are set as follows.

A: Histogram drawing and analysis of the shaft parts. The subject requires students to measure parts data and analyze data, and draw histograms by statistical quality control software Minitab.

B: The quality control of shaft parts machining process. The subject requires students to measure parts data and draw control charts and analyze process capability.

C: Analysis of failure box parts. The subject requires students to find out the reasons and solutions to the problem by using quality tools.

The Reform of Curriculum Evaluation Methods. The test score of "quality management and reliability" are usually the weighted average of the usually grade and the examination grade, the traditional usually grade include the score of students attendance and homework, and it is usually 20% ~30%, and the examination grade is 70% ~ 80%. Through the examination reform, the usually grade include the score of students participating in classroom activities, and the submission of assignments and case analysis, case study presentations in the classroom, interactive discussions and so on, and it is 30% of the total score. In the final examination in order to minimize the proportion of the rote answer questions, increase the proportion of the open questions and case analysis, and the examination grade is 70%. Through the guide, the students focus on learning ability, independent thinking and the sense of teamwork, the effect is remarkable.

3 Conclusions

Improving the quality of teaching is the eternal theme of the pursuit of higher education, training high-quality talents is the bounden duty of teachers, and constantly studying teaching methods and making students easily to accept them and it is an important measuring indicator of teaching effectiveness [5]. The teaching reform of "quality management and reliability" is a endless process, and only reforming in the teaching course and exploration in the reform in order to maintain the advanced nature of the course content and the diversity of teaching methods, and mobilize the enthusiasm and initiative of students, and make college graduates get the social recognition and welcome.

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Discussion on Classroom Teaching to Improve Specialized English Ability of Engineering Students

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Abstract. This paper aims at search for good teaching method in order to improve specialized English ability of engineering students, which will be used as one practical and effective solution to the employment problems of graduates. The teaching content should be built in the following phrases, that is, developing respective document for the base text, taking positive part in teaching steps for the core, and making active practices in speaking and writing for the addition. The teaching method should be developed emphasizing the communication ability of engineering students, and proceeded in English medium instruction. The reform of teaching method and contents of specialized English to engineering students will boost the overall quality ever to succeed in future completion of job-looking and promotion opportunity.

Keywords: English ability, Engineering student, Teaching method, Teaching content.

1 Introduction

Developments in engineering and modern technologioes are thought to be the most important requirements for the new century in the globalised world, and the globalisation associated with economics, has taken sufficiently significant effect on technology and languages, which has introduced many chanllenges in engineering education[1]. Moverover, space range of employment of graduation rapidly extendes, and frequency of job change quickly rises, which has become common and unproven facts faced by job hunter sespecially graduation of engineering stduents, which furtherly aggravates the difficulty of job-looking[2]. The major obstacle to engineering students is the widening gap betweem increasing employment requirements and limted technologies and skilles, which pushes students including freshman and sophomore and junior and senior to struggle in campus. Students in universities and schools, for example, engineering students, have spend nearly whole personal time on acquiring so many diplomas to demonstrate abilities to some degree enough to take on the position in the furture. Achivement of students are not proportional to devotion, which often demages their courage

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and condfide enssential in their lives. How to cope with the awkward state of art of campus lives of engineering students has been one of hot research topics taken into consider widely by many experts in related fields[3-6]. Taking specialized english for example, this paper presents dicussion on classroom teaching to help engineering students improve themslves with related abilities in given period from the following subpoints such as teching content and teaching method. In each subpart, state of art of practical problem is firstly investigated, and then, the solution to corsponding problem is brought out based on the above analysis. To sum up, series of reform in teaching content and method contibes to improve individual qualities quickly and rapidly.

2 Teaching Content

Investigation of specialized English teaching in classroom of engineering students at present campus was made and found that the worried facts, that is to say, the obvious present situation on classroom teaching of specialized English can be simply described as followed: shortage of teaching English for special purpose for engineering course, and few drills in practical techining of English for special purpose in classroom, which are the source resulting to the dissatisfied education results. Based on the findings of classroom teaching content of specialized English, the solution to the above description are brought out in following three aspects.

Firstly, development of respective document used as the base text for engineering student must be made while carefully thinking over the specialized requirements of school or collage at own campus. The factors taking strong effect on construction of text includes university history and professional development and new industrial frontiers. The university has developed from profession field, and accumulated technological materials and study documents, reports and so on, which doubtlessly brings out prerequisites to build up the text fit for engineering students studying at campus as well as accepted by them from the cockles of the heart. Moreover, development achievements in recent years should be included in text to replace the outdate parts which are not practically and widely used in factory and workroom, this deeply enlarges the extension of text and increases the interest in text which helps to change the understanding of specialized English to engineering students.

Secondly, positive participation in teaching steps regarded as the core for engineering students should be built up firmly in spirit. Classroom teaching as the vital process should be effectively utilized, so teaching steps in which engineering students should take part with their efforts and strength. Various teaching intensity and difficulty should be chosen to be fit for different teaching steps according to change in the moods and likenesses of students at classroom. Different teaching rhythms effectively strengthen the attention of classroom students and even so help engineering students to concentrate their spirits on teaching processes including of all over the teaching steps. Taking part into teaching processes of all of students indicts to some degree their active devotion from the behaviors, which seems rapidly lengthen the student times viewing from perspective of the result and even so increases the opportunity success in job-looking of engineering students on their career way.

Finally, active practices in speaking and writing as the addition for engineering students should be carried through strictly and insistently. The points emphasized and energy spent in culturing English abilities of engineering students used to be passive study in the forms of reading and listening, while active study of engineering students in the forms of speaking and writing will be strengthen and stick to practices in classroom teaching English to engineering students. The ability to work in multicultural environments and to take on communication skills is becoming more and more important in today's changing economics conditions; the effective method to improve the above ability seems the singular method which is about reading and listening section in classroom teaching of engineering English. The urgent problem before student will be about personal quality, such as brave and perseverance and persevering, which keep engineering students continuing their study and lighting the eagerness for lifelong learning of engineering students. In this way, the communication ability is deemed to develop quickly and rapidly after continual devotion which increases the quality of engineering students and their belief in promotion of positive in career lives

3 Teaching Method

As described above, teaching specialized English is one process costing, which needs investing a lost of time and energy into. How to achieve a good result culturing specialized English abilities to engineering students is worthy of discussion, it is common viewpoint achieved that teaching method of specialized English is one key aspect, not exception of teaching content. The present teaching method applying in specialized English to engineering students can be summed as followed: method of lecture for nearly all classrooms, passive learning during the teaching time. Based on the reorganization of classroom teaching method of specialized English, the solution to the above description are given in following three aspects.

Firstly, teaching methods emphasized the communication ability of engineering students, should be developed and applied in the extensive range. Culturing communication ability depends strongly on drills in active English abilities, such as speaking and writing abilities. Those abilities can only be developed in expressing personal viewpoint without delay time and without help from ready reference, which determines neither modal answer to each questions nor easy task in short period. In the way to communication ability to engineering students, the frame of education can be relay on the real activities such as new product development explanation meeting and customer requirement collection and so on, through which the active reaction respond to the question in listening and writing form must be raised in natural condition. The next steps is needed during the processes, just following the footsteps of the baby, first listening attentively, secondly imitating what you have listened and repeat , thirdly reciting and practicing some words and phrases and sentence patterns, fourthly putting things around you and thoughts in your mind freely in English either by speaking and writing[7].

Then, English medium instruction can be emphasized and used, which is necessary on the way of life. Because teachers of specialized English play a leading role in providing engineering students with the knowledge, skills and understanding

they need to read, write, speak and listen effectively. Teachers' driver to English medium instruction helps to make students to live in English environment like an in-house atmosphere. Because engineering students always hang around with people speaking mother language, and they often get lost and frustrated when they are put into a pure English environment atmosphere. The English medium instruction here emphasizes pure English environment for language learner which can be compared with the deep water for beginners of swimming. For human babies' natural endowment and their lack of sense of danger, they can easily manage the deep water. Similarly, engineering students are entirely immersed in the language in specialized English classroom and try hard to understand it, and they have already got used to the sound system of language and been able to tell the emotions with the language and put it into practice without worrying about losing face by making mistakes.

4 Examples

The teaching content and teaching method described before are used to value the effect of it through practices, the comparison of four class of engineering student in engineering specialized English. The result of it is showed in Table.1 from which indicts great change has taken. The excellent grade comes into being after carrying out the teaching change, while no less poor grade are not left; the account for proportion of the good and middle grade in whole students increases rapidly and like the scores. Above change taken between new teaching and traditional kind can be attributed to novel teaching content such as respective document as base text, and new teaching method for example English medium instruction.

Table 1. Result of comparative experiments

Item / group		<60	60~70	70~80	80~90	90~100	Mean scores	whole
New teaching	1	0	0	2	25	3	85.37	31
	2	0	0	9	18	1	82.82	28
Traditional teaching	3	1	5	7	10	0	73.30	23
	4	3	9	5	4	0	68.05	21

To deepen analysis, the excellent grade rate and mean scores are figured out in Fig.1. From Fig. 1 those two aspects bring out the rise in mean scores of specialized English test, in which the components of paper used emphases the

communication ability such as listening and writing sections, additional tests are processed in classroom and through different question on the similar topic, through which putting things around yourself and thoughts in mind in English is practiced and tested at the same time. It has become natural and happy facts nowadays that expression of things around person and thoughts in his or her mind has been common things in specialized English classroom of engineering students after new teaching content and method are steeply carried out for continual several years, and strictly accord to the above four steps in culturing communication ability during the process. The only obstructs to driving English teaching on the good way to good effects is to overcome disbelief in oneself worrying about making mistaken in speaking and writing, which in practices are not necessary and neglect, observed by babies swimming underwater.

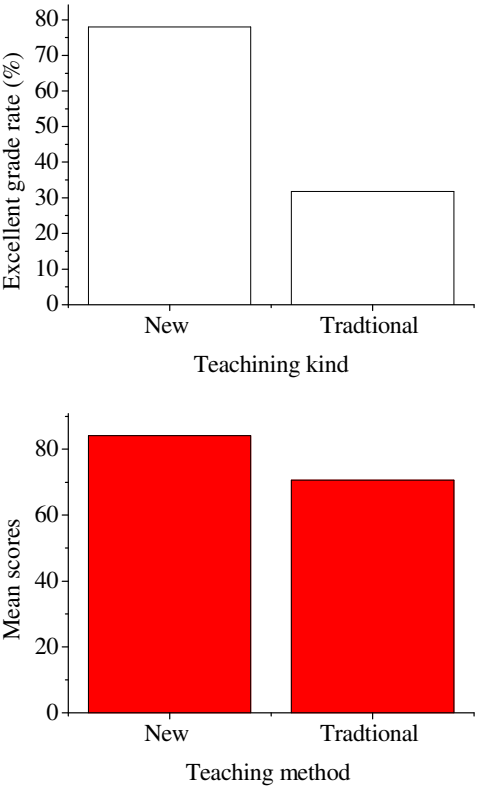

Fig. 1. Comparative effect of different teaching kind

5 Conclusions

To improve specialized English ability of engineering students, the novel teaching content and method is given out. Development of text of respective document should be firstly done in teaching content reform, companying with partition into teaching steps for the core and practicing speaking and writing for the addition. At the same time, emphasis of communication ability and application of English medium instruction should be strictly done in teaching method innovate. Example of comparative teaching indicts that the reform of teaching method and contents of specialized English to engineering students will promote the overall quality rapidly and quickly.

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Exploration and Analyzing of Bilingual Teaching in "Engineering Graphics" in College

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Abstract. "Engineering graphics" is a basic technical course that has systemic theory and strong practical technology. Bilingual education is a course taught in two languages. Bilingual teaching in "engineering graphics" is not only to use English to teaching, but also the characteristics of engineering graphics course to transfer to students who has the basic quality engineers through learning. This paper analyzes the necessity of the application of bilingual teaching in the engineering graphics in teaching process and the request of teachers and students etc, and points out the obstacles in bilingual teaching, such as Language obstacle, Technological obstacle and psychological obstacle. It put forward a concrete implementation from preparation, implementation and summarize. Finally, it formed a complete engineering graphics course bilingual education system through soliciting opinions and suggestions from students and analysis the effect of bilingual teaching carefully.

Keywords: Engineering Graphics, Bilingual Teaching, Obstacles.

1 Introduction

Bilingual education is a course taught in two languages [1]. "Engineering graphics" is a basic technical course that has systemic theory and strong practical technology. It is a discipline that studies the principles and methods of drawing and reading engineering drawings, including descriptive geometry and mechanical drawing, engineering drawing, construction drawing, construction graphics, shadow and perspective, computer aided design and AutoCAD computer-aided drawing. "Engineering graphics" is the machinery, construction, airlines and shipbuilding industries for technical communication, is the necessary tools for common technical language to engineering. In order to connect with international high-tech, bilingual teaching in college in the new era university education has become the inevitable requirement. The purpose to implement bilingual teaching in "Engineering graphics" is to training the ability of students oral or written with English as the technical exchanges, to using English reading and rendering of engineering drawing technical skills. Bilingual teaching in "engineering graphics" is

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not only to use English to teaching, but also the characteristics of engineering graphics course to transfer to students who has the basic quality engineers through learning.

2 The Necessity of Bilingual Teaching in "Engineering Graphics"

Engineering graphics course the main reason for the introduction of bilingual education It has two main reasons that introduction of bilingual education in "Engineering graphics".

Firstly, one of the basic qualities of creative talents is higher foreign language level. In order to adapt to the world trend of opening teaching with international standards, we should undertake to bilingual teaching. Secondly, "Engineering graphics" is a basic technical course that has systemic theory and strong practical technology, mainly to cultivate students' space imagination, spatial analysis and spatial idea image thinking ability that can draw and reading of engineering drawing. Engineering drawing is the important tool to expression and communication technology and is a language in engineers international. Therefore, it is necessary to using English expressing and understanding of engineering drawing.

3 Requirements of Bilingual Teaching in "Engineering Graphics"

Requirements for Students. Students who can accept the bilingual teaching must have strong English listening, speaking, reading and writing ability and self-educated abilities. Therefore, outstanding student selection and a stage English intensive training are indispensable [2]. As is known to all, it is certain difficulty to learn engineering drawing lesson with Chinese for the most professional students, so the students' self-learning ability are particularly important. Learning common English, professional English and professional class, it allows students to the combination of spending a lot of time and energy to memorize words, to digest professional knowledge.

Requirements for Teacher. "Engineering graphics" is a new course without contact with other courses, which requires the teachers using English expression, and explaining the important part using Chinese. Bilingual teaching in "Engineering graphics" required teacher having the highly professional quality. Now engineering graphics is in reform stage, will former descriptive geometry, mechanical drawing and now the computer drawing together, so for teachers' level requirement is distinct, requests the mother tongue of the engineering graphics teaching skill and professional foreign language level, and to ensure that the teaching task completion of this course, raises the student space stereo thinking ability, drawing and reading mechanical drawings and computer graphics ability, also let students contact, learning, and engineering drawing related English vocabulary, sentence structure, etc.

Problems of Bilingual Teaching in "Engineering graphics"

Language Obstacle. "Engineering graphics" course is opened to most freshmen. College English course is just beginning, and students' English level is high school level. It is usually opened the natural classes, students in the listening and spoken language have a lot of difference. Glossary of Chinese name is not well understood for students, English expression needs a gradually familiar, memory process. Some students couldn't keep up with teachers' teaching rhythm. Although there are two versions in English and Chinese teaching material, it is different in content of two versions without a corresponding comparison relationship, students feel very helpless [3].

Technological Obstacle. "Engineering graphics" classes usually divided into descriptive geometry, drawing basis, professional drawings and computer drawing parts. Descriptive geometry uses projection method shown space research objects and graphical space of geometry problems of basic theory and method. This section includes a projection method, planes system construction, space objects on its projection system projection relationship, it is difficulty in technically, it is required to have certain space thinking ability and imagination. Engineering drafting studies the methods of reading and making engineering drawings. It deals with representation of drawings, dimensioning, conventional representation of standard parts and commonly used part, detail drawings, assembly drawing, and so on. All drawings must be complete, clear, concise, and accurate.

Professional graphics demand students must have certain related subject practice experience, understand mechanical drawing in the processing, assembling parts of the architectural drawings process structure, construction, interior design, the shadow and the use of perspective aspects of content; Computer graphics respect criterion requirements students have relevant computer software and hardware foundation, these aspects of the basis and practical experience directly affect students' learning effects [4].

Psychological Obstacle. Some students did not understand the English and feel lack of teaching materials. Classroom learning is not well digested by the content of their own after school to make up classes. Even individual student class is not very serious, or absent in classroom. It indicates that some students in certain degree of psychological discomfort of bilingual education, and seriously affects their motivation to learn and enthusiasm to play, on courses of study resulting in adverse effects.

4 Design of Bilingual Teaching in "Engineering Graphics"

Bilingual teaching can be divided into preparation, implementation and summarized shown in Figure 1. In order to achieve satisfactory results, each stage must be carefully, attentively.

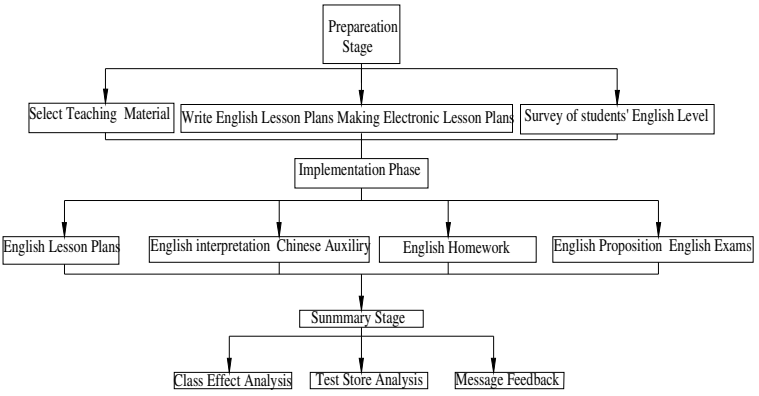

Fig. 1. Design of Bilingual Teaching in "Engineering Graphics"

The first is how to do the work in the preparation stage. Selecting an English original textbook is the first step. Even through good teaching is not a sufficient condition to improve teaching quality, taking the original material is fully digested is a necessary condition to improve the quality of teaching. In addition, the following is to make a good use of the textbook you have. Yet, it is not rigidly adhere to of materials, but jump out of materials, higher than the material, and constantly add new content. In addition, according to the school curriculum, curriculum standards and in accordance with the characteristics and needs of bilingual education, appropriate adjustments to the curriculum, emphasis on the basics of the course, basic principles, the basic mapping methods and applications. This is a very important part of the effect of a direct impact on bilingual education.

During the implementation phase, the most important effect is the class teaching. Because students connect the bilingual teaching newly, and what they learn is a new curriculum for them. Therefore, while teachers using English to express, they have to explain what they said clearly, especially for the key and difficulty part. Interactive teaching methods should be advocated, and students should put out anything they do not understand immediately at any time and then to discuss settlement. In order to improve the efficiency of student learning, every time before the teaching, teachers should introduce students the professional words and let them to preview the contents of the next lesson.

Diversification of Teaching Methods. In the engineering graphics bilingual teaching class, teachers are equivalent of teaching two courses (Engineering Graphics + Professional Foreign Language) at the same time; it is very tense and difficult for Professors to complete this task of teaching within the prescribed teaching hours. Therefore, we choose to teach in the English way of writing on the blackboard + multimedia. Specialized vocabulary, some important theorems and descriptive geometry in the drawing that we used in each class are teaching in a simple way of writing on the blackboard-based teaching methods. learning process should follow the outside to the inside, by a process of shallow depth , from the point, line, surface, body start by writing on the blackboard are familiar with the

unique advantage of the rapid, adaptation and access to courses of study; in engineering drawing part, due to highly specialized, complex graphics and other factors we use multimedia-based teaching methods, as part of the students after completion of Geometry has been the basis of the content of this course have a certain grasp of the basic professional vocabulary familiar to some of the characteristics of engineering drawing, writing on the blackboard the amount of information provided in the form can not meet the the needs of students, so the images using multimedia, text, sound, video and other forms, vivid, multi-angle reproduction of teaching content, to help students quickly and solidly have a good understanding of professional knowledge[5].

Homework and Evaluation Methods. Bilingual engineering graphics course evaluation methods in two forms, the first is a closed exams in English, the second form is "three-self model", the so-called "three-self" is a student under the teacher's request and authorization, the use of voluntary registration way to design test questions in English, their answers, after examination by the proposition of students scoring, scoring, commenting, but also out of the papers on the topic and writing experience, an oral reply.

What is worth mentioning that the information feedback must be carried out after implementation of bilingual education, students' assessment is the key to success. Soliciting opinions and Suggestions from students is necessary, and analysis the effect of bilingual teaching carefully, finally formed a complete work.

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An Analysis on the Differences between the Specialty-Education of Sino-American Construction Engineering Management

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Abstract. The paper, beginning from the course-system setting, the teacher-education measure, the student's Occupational Ethics, the practice ability, the communication-ability's cultivating and so on, makes an analysis of the differences between the specialty education of Sino-American Construction Engineering Management, points out the problems and shortcomings existing in present education of the specialty education of Project Management in our country, and puts forward some means and ways to solve the problem.

Keywords: Construction Management, Project Management, Course-System, Cultivated Scheme.

1 Introduction

Basing on the integration of the original specialty such as Construction Management, International project Management, Real Estate Management and so forth, China Project Management was set up by Ministry of Education in China in 1998. At present, over 200 universities offer the specialty in our country. For a few decades, with its scale's widening, it has developed very quickly. However, the teaching system has been in the exploration and perfection, and there is good distance between the arrangement of content and the real needs of the management posts of China construction industry. Presently, the competition mechanism of China construction has been complete and perfect, which has connected the international construction market. It is in great need for the internationalization of construction to examine the specialty education of China's Engineering Management from the international perspective, to promote the identification of the education and the talent internationally and as the result, to strengthen China construction enterprises' ability of taking part of the international competition. So it is significant to study the thoughts, the education teaching-pattern and means of the specialty education of foreign construction management represented by American. By which, we can use their experience to heighten the teaching-level of the major—China construction management and to improve the identification of the graduates in the working market.

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2 The Essence of American Construction Engineer Management

The education of Baccalaureate Degree and Associate Degree have been under the auditing of American Council for Construction Education (ACCE)being established in 1974 [1] and the valid is lasted for 6 years. Though ACCE tells the authorization are aiming at the construction specialties and not limits the scope of construction management majors specially but in fact, all the specialties passing the authorization are almost construction ones. From the standards of the authorization, it is aiming at the common construction management majors. China Project Management is a new specialty in our colleges and universities and was set up in 1998. In October 1998, the High Project Management Course-Specialty Guiding Committee was established by PRC Ministry of Construction, and makes the Project Management Cultivating Plan, the Teaching Program of the Platform Courses of Project Management and the Course-Teaching Program of Project Management Major. According to the Project Management Cultivating Plan, the specialty Project Management aims at the Construction Trade and cultivates the talents majoring in Construction Management. So the courses setting up in our country are equal to the construction management specialties in America. Generally, in the position of Project Management Specialty, it shows no difference between China and America [2]. The Present Differences between the Specialty-Education of Sino-American Construction Engineering Management are as follows:

a. The Setting of Course-system

According to the Project Management Cultivating Plan making by PRC Ministry of Construction, the specialty of Project Management offers five course-directions as follows: Project Management, Operation and Management of Real Estate, Investment and Cost Management, International Project Management and Property Management. The course-system is basic courses-platform courses-directional courses. The platform courses belong to major basic courses including technique platform courses, economy platform courses, management platform courses and law platform courses. Statistics of the ratio of class hour to credit of the four platform courses coming from the five home universities' Project Management Specialty—besides Tsinghua University suggest that, technique platform course adds management platform courses, the average ratio of class hour to credit is 75.95%, and the average ratio of class hour to credit of the project technique platform courses (architectural science& Construction) in several American universities is almost 82.75%.

Standards and Criteria for Accreditation of Postsecondary Construction Education Degree Programs of ACCE stipulate that the specialty of Construction Management should meet the need of general knowledge education and major education to offer the related courses which is necessary for supporting the subject. As the result, the standards ask to offer the five kinds courses such as Mathematics and Science, Mathematics and Science, Business and Management and Construction Science and Construction [3]. Among them, the highest average ratio of class hour to credit is that of the courses of Construction Science and Construction, and they are 42.41 and 43.4% [4], respectively. ACCE awards the education unit right

to develop the course system, to award the degree's name and levels, and to identify the scores of students transferring from other schools, encourage the unit which has pass the authorization to evaluate the present course system frequently and develop the new one which can show the change trends of construction technique and management. The course system can be developing into a single specialty as well as a part which can be chosen by many majors, and that is similar with that of the five directions set up in Chinese Engineering Management.

b. The Measure of the Cultivation of Teaching Stuff

According to ACCE, the continued improving of teacher's ability is the necessary prerequisite to the valid teaching. So it asks for the education unit to take the evaluation of teachers as important as the teacher's experience and formal education background. What's more, within the colleges and universities policy, the administration personnel should encourage teachers to develop their major ability, for example, to spend the holiday on obtaining work experience, learning and studying, taking part in major groups, presenting major conference, seminar and so on. Teacher should take part in the major organization and the service of society and district, and interpret the education of building to other major person and public. The standards of ACCE encourage the teacher to engage in consulting work, which is benefit to the education of construction and has no conflict with their task and responsibility. And the education unit should ensure all teachers the opportunity to develop their specialty. In our country, Project Management is a new specialty establishing in 1998, and in a short time, over 200 universities have offered the major. However, the teacher is in great need, and the excellent ones are very rare. So all the universities have no way to ensure the teacher to go out for further study, few teachers have taken part in social organization and consulting service, and it is impossible for the teacher to have the chance to develop their major. By investigating the teachers of Project Management courses, there are 1-2 professors in nearly 60% Colleges and Universities of this specialty; 2-6 associate professors in nearly 68% and 3-6 docent instructors in nearly 59%. From above information, most Project Management Specialty in our country lack qualified teacher personnel, and from the aspects as title, education background and major ability, there is great distance between China and America.

c. The Cultivation of Occupational Ethics

The high education in China aims at cultivating the high-class major talent and management personal who is comprehensive development in moral, intelligence and sports, and can meet the need of socialism construction. So from the very beginning, the colleges and universities pays great attention to cultivate student's ideological politics and morality, but the courses provided for by the State, and generally, the content does not aim at special major. And many special trade's people, e.g. the construction administrator, what they are need in occupational ethics and major spirit has not brought into the line with the specialty plan. ACCE brings code of ethics into the compulsory course of general knowledge, and the credit will be at least 1 score. Moreover, code of ethics must mix into at least five construction courses or construction& science courses. Grade Three has one compulsory course—Ethics in Construction in American Ball State University [5].

And the course, from the contemporary practice to development of construction occupation, teaches modern construction industry ethics and specialty spirit, analyzes the present and future role of construction administrator from the international perspective, explain the principle and practice of trade spirit, the responsibility of society, district and environment, rules and regulations, behavior code and practice, law requirement, license etc., comment the establishment and framework of enterprise, and from the global aspect to analyze the influence of economy, market and the diversity of culture on construction management. Additionally, it specially tells the labor law relationship between worker and boss and the benefit of life-long learning. The quality of construction has direction influence on the safety of every people's body and property, but there are many problems in Chinese construction quality. The main cause lies in the incompleteness of related regulations and rules and surveillance system, and at the same time, the employers' common lack of the occupational ethics and specialty spirit also has great influence on it.

d. The Cultivation of Practical Ability

Because of taking teaching too much for granted but lacking teaching practice, students are short of vivid experience of solving problems, which hampers them from using theory to solve practical problems. By investigating statistics, "less than normal practical teaching contents" exist generally and sticking out clearly in construction engineering management specialty of china. Take the undergraduate education of construction engineering management specialty as an example, besides usual curriculum-design and graduate-design, there is little time for them to practice for graduation. In addition, before or during practice, students of construction engineering management in China, they are not clear for the rights and obligations of two parties, which great reduces their obligations and awareness of serving for enterprises, and at the same time, diminishes training units' cultivating responsibility. As a result, the paper suggests training units fulfill revising and perfecting specialty cultivating plan obligations in time. ACCE demands it is that teachers, students and construction industry similar on-the-spot investigation, exchanges and cooperation in the form of lectures for students group should be recorded. Students should actively participate in related construction industry associations, learned societies etc., and also get work experience of the trade by taking part in activities such as practice, co-operation educational programs and so on. Although ACCE hasn't a clear demand on working time, generally, construction management majors of American University ask a student to work not less than 800 hours before graduation. And the educational institutions must establish consultative committee composing of representatives from the field of construction industry, and it must have a meeting within a year, actively gives suggestion to help educational units to revise and perfect the professional training program.

e. The Cultivating of Communication Ability

ACCE claims that people and relationships are involved in construction process, and it is absolute necessary for engineering builder to have the oral, written and understanding ability. The standards place courses of oral and written communication on that of general knowledge education, demand the credit of oral and written communication more than 2, and both of them are formal and separate courses, total credits

must be at least 8. Besides separate courses, verbal, technical writing or business writing must be integrated into at least 33% of the construction and building science curriculum [6]. But the project management professional students in our school pay more attention to specialty theoretical study and design test, etc. Developing students' communication skills is largely ignored. In the Southeast University of Project Management Professional Training Program [7], capacities of the graduates have four, and the last is the expression, management, and public relations capacity, but in its training program, these courses are not included. Ministry of Construction's "Project Management Professional Training Program" and other key universities of project management professional training programs haven't a clear communication skills training requirements for students.

3 Suggestions and Countermeasures

3.1 Positioning Subject Explicitly

Subject positioning is important for professional development. Only according to accurate subject positioning and training objectives, developing targeted training programs, designing the curriculum system and determining the course content, school can foster the qualified personnel adapting the development of market economy. The positioning of our country engineering management subject should be: a subject that involves management problems, such as planning, organizing, resource allocation, command and control and so on in the engineering technology activity. Engineering management education in China should follow a market-demand-oriented, emphasizing a practical road. On the basis of fully reflecting engineering management profession school characteristics, combining with their own advantages, national policies, market demand, Training units determine the training objectives.

3.2 Strengthening Teaching Staff

It is an urgent task currently to strengthen teacher education in engineering management professional education. Hire the staff of practical experience, highly theoretical level to participate in teaching activities, improve the teacher structure. Introduce the external experts with practical experience to conduct case studies teaching. Strengthen in-service training for teachers. Support teachers to participate in the domestic and international training courses and seminars. Encourage teachers to devote themselves to social appointments related to their teaching. Strengthen the practical awareness of teachers to improve their practical experience. Improve the knowledge structure of teachers. Establish access system for professional teachers of engineering management class, and at the same time, take the assessment mechanism for teachers. Promote teachers to research and improve teaching methods. Establish the evaluation and incentive mechanism of teachers.

3.3 Adjusting Teaching Content

Engineering management talent should have systems thinking, management and organizational skills, good oral and communication skills. Master engineering

technical expertise, and have the ability of economic analysis, computer software application, and practical operation. In the curriculum, emphasize knowledge hierarchy integrity, coordination and balance, coordinate the ratio and proportion between engineering technology and management courses, and the ratio and proportion of theory and teaching practice. On the one hand, hang the engineering content and knowledge management together organically; the other hand, strengthen the engineering and practice teaching. At the same time, strengthen the education of the professional conduct and the spirit of profession to the students. Foster students the ability of good oral expression and social skills.

3.4 Strengthening Practical Teaching

Pay attention to teaching Practice. Establish training bases through such means as Cooperation among industry, universities and research institutes. Strengthen teachers' practice awareness and improve their practical experience. Encourage students to participate in various competitions, entrepreneurship design competition, and subject study. Strengthen the application of modern information technology in engineering management. Make the best of modern teaching methods, such as: application of some project management software, to establish some laboratories to conduct engineering management simulation. Connect Curriculum design and graduate design organically, and detail assessment criteria. Suggest increasing the "whole process of project management simulation" to dissertation stage. Increase Credit Hours and course content; establish appraisal standards of practice Course. Implement case teaching, establish case base. Strengthen the theoretical study after having practiced. Strengthen the teaching link of engineering and practice. Increase case Teaching, simulation training or on-site teaching.

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An Exploration of Curriculum Construction in Higher Vocational Education with a Working and Learning Combination Pattern

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Abstract. This thesis takes the curriculum development of "digital design of Mechanical Products" as an example to explore and discuss how to organize and conduct fine course construction of higher vocational education with a talent cultivation pattern of working and learning combination. It gives a detailed discussion of ideas and methods in course design contents, teaching resource construction, teaching methods and the construction of multiple teaching evaluation system. It deconstructs and reconstructs curriculum around establishing learning situation, sequencing teaching contents, innovating teaching models and constructing multiple evaluation system, etc. It implements curriculum teaching in the real manufacturing environment of enterprises, which shorten the distance between schools and enterprises, realizes the curriculum cultivation goal and obtains favorable teaching effect.

Keywords: Working and Learning Combination, Curriculum Construction, Exploration.

1 Introduction

Curriculum is the foundation and relying of constructing students' ability, as well as the key link and direct vehicle to improve the teaching quality. The construction of higher vocational curriculum should highlight the characteristics of higher vocational education, and the reflection of the combination of working and learning is the key. Higher vocational curriculum construction of high quality and high level demands local industry and enterprise experts' cooperation in developing curriculums and constructing professional curriculum system. It should realize the dynamic combination of the teaching contents of professional curriculum system and cultivation goal of experts, clarify the tasks, requirements, status and role of curriculums in professional curriculum system and determine the curriculum cultivation goal of vocational ability, i.e. the cultivation of students' professional ability, social ability and method ability in order to ensure a scientific, vocational, practical and open curriculum development.

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2 Induce Learning Working Tasks Based on Professional Post Analysis

The curriculum of "Digital Design of Mechanical Products" is the core curriculum of cultivating the all-purpose ability of the post groups of mechanical design and manufacturing expertise. Through the study of this curriculum, students should grasp the necessary digital modeling of mechanical design and manufacturing technology post groups, stress analysis, design ability of virtual assembly and other mechanical products, in order to provide knowledge and skill support for the digital design, digital control processing, mould design, manufacturing and other professional posts of mechanical products. Based on investigations, curriculum development is conducted by the cooperation of enterprise experts to select 8 real products of enterprises together as the teaching vehicles. These vehicles are not only the real products of well-known enterprises. Moreover, its design and manufacturing process cover parametric modeling of basic characteristics such as stretching, rounding, scanning, stress analysis, as well as knowledge and ability requirements of assembly, etc. The curriculum takes the task implementation process as the main line, and adds knowledge points, skill training and ability cultivation in the process of task implementation. Guided by teachers, students independently accomplish tasks to construct knowledge system, as well as accomplish the teaching of ability goal and affective goal.

3 Sequence Teaching Contents Based on Cognitive Learning Rules

The consolidation of knowledge, the cultivation of ability, the formation and proficiency of operational skills need constant learning and repeated drills, which is never a simple mechanical repetition. Therefore, the content organization of the curriculum of "Digital Design of Mechanical Products" should start from the shallower to the deeper in a proper sequence. The work tasks should start from unitary to synthetic, product structure from easy to complicated and skill training should be in a proper sequence. Those eight real enterprise products should be carefully arranged and the teaching contents should be sequenced to make students' knowledge and skill trainings ascend in spiral, which conforms to the cognitive learning rules.

4 Create Learning Situations Which Are Enterprise Working Process–Oriented

The curriculum construction of working and learning combination is the establishment of learning situation based on the working process of enterprises, and to arouse students' desire to learn actively in the process of accomplishing work tasks in the "enterprise manufacturing situation". The responsibility of teachers is not only the instruction of knowledge and skills to students. More importantly, it

is to arouse the professional interest of every student, strengthen the students' desire for knowledge and guide students to learn with the right direction, attitude and method to enable them construct their own knowledge frames in the interaction between the learning environment and the working environment. This new frame is no longer mutually separated and puzzling "fixed knowledge", but the knowledge structure gradually grasped in the professional activity process based on the requirements of professional activities.

4.1 Teaching Design of Consistent Learning Tasks and Working Tasks

Curriculum takes the real products of "fuel tank hanger, cleaner tube support, vibrating shaft of tamping tool" of the enterprise as the teaching vehicle and establishes eight learning situations based on the complete working process. It constructs working tasks of learning and integrates theories and practice by working tasks. The teaching goal is achieved by guiding students to experience the complete working process, accomplishing working tasks and cultivating the knowledge, ability and quality required in their posts, in order to accomplish learning tasks of working.

4.2 Teaching Situation of Integrated Places of Theory and Practice

The curriculum teaching design integrates classroom teaching and training place. In the imitation of real enterprise situation, the integration of "teaching, learning and doing" is realized. The curriculum makes full use of digital design of science and education city of Changzhou, rich teaching resource of manufacturing technology base, as well as the facilities of cooperation enterprise. Students are guided by professional teachers and part-time teachers of the enterprises together to accomplish the working tasks of learning of that curriculum.

4.3 Teaching Organization of "Six-Step-Approach" Centering on Students

Curriculum teaching organization requires organizing students into a team in the manner of groups. It requires organizing teaching contents with the proposal as the main line and conducting teaching based on the complete activity process of six steps (six-step-approach) in the organization of teaching units, i.e. "information, determination, planning, implementation, assessment and evaluation". In the information phase, firstly, it is to assign schedule, and inquire and learn the knowledge points of that proposal by the guiding text. In the planning phase, brainstorming is adopted for everyone to air their own views. Planning is conducted by the guiding questions of the information and guiding text that have been already known. In the determination phase, analytical comparison approach could be used to obtain the optimal proposal. In the implementation phase, the method of leaning while doing is adopted to consolidate the learning of knowledge points and skill

points. In the assessment phase, demonstration method could be recruited to display and communicate their achievements. In the evaluation phase, multiple evaluation system is introduced to evaluate the learning achievements.

5 Construct a Plural Evaluation System, Combined with Human Resource Management Mechanism of Enterprises

The goal of academic evaluation of students is not to eliminate students, but is established in inspiration, encouraging students to grow in learning practice and promote students' sustainable development. The academic evaluation of students transforms from independent evaluation method of school to the integrated evaluation of school, society and enterprise. While formulating students' achievement evaluation system, enterprise participation and support should be obtained as much as possible. The mechanism of internal human resource management in enterprises and evaluation system of schools should be combined. It should take the professional ability cultivation as its orientation and combines professional quality assessment and professional skill assessment to be an open and multiple evaluation system.

5.1 Evaluation Subject Multiplication

The subjects of student evaluation include instructional teachers and enterprise skill instructors. A multiple evaluation mechanism of professional teachers, enterprise practice instructors, and mutual evaluation of students, as well as self-evaluation of students is established.

5.2 Evaluation Content Diversification

The pure knowledge assessment transforms into knowledge assessment, ability assessment and quality assessment. Written examination, manipulation, product manufacturing, overall analysis report, practical problem solving on site and working performance accomplishment of working tasks of learning are adopted to evaluate students' academic achievements.

5.3 Evaluation Method Procedure

The original evaluation method of "one examination for the whole life" transforms into the combination of proposals and tasks. The ultimate goal of post ability training is segmented into several units for sectional evaluation in the whole process. The time of achievement evaluation is determined by the specific situation of professional skill contents contained in the practical curriculums, and process evaluation and result evaluation are designed.

Table 1. Curriculum teaching implementation case

Table .		Teaching organization		Place	Method
Information	Proposal lead-in	Proposal description: Teachers extend task schedule and guiding text		Multi-media training room	Guiding text teaching method
	Information inquiry	Teacher	our-stage teaching method is adopted to instruct the key points involved in students' proposals	Digital design and manufacturing training base	Four-stage teaching method Case teaching method
		Student	Review and inquire knowledge needed in accomplishing the proposal based on the guiding text	Enterprise investigation	
Planning	Proposal formulation	Teacher	Encourage students to speak out their ideas and design thought courageously	Digital design and manufacturing technology base	Brainstorming approach Encouragement and excitation approach
		Student	Students express their own design thought and proposals in groups		
Determination	Proposal optimization	Teacher	Comment on students' proposals and recommend the optimal design proposal	Digital design and manufacturing technology base	Proposal demonstration approach Enlightening and interaction approach Analytical comparison approach
		Student	Demonstrate sketch proposal in groups, modification of proposal to finally determine the design proposal		

Table 1. (*continued*)

Implementation	Proposal implementation Correction and improvement	Student	Work sharing and cooperation: three-dimensional modeling	Digital design and manufacturing technology base	Learning while doing approach
		Teacher	Inspect and guide		
		Student	Students check the works of each other t	Digital design and manufacturing technology base	Enlightening and interaction approach Instructional approach
		Teacher	Inspect and comment on overall problems		
Assessment and Evaluation		Teacher	Overall assessment not only assess knowledge and skills	Multi-media training room	Proposal demonstration Inspiration encouragement approach
		Student	Students report in groups, work achievement display		

6 Conclusion

The curriculum development of "Digital Design of Mechanical Products" with a working and learning combination takes the real products of the enterprises as the teaching vehicle. It deconstructs and reconstructs curriculum around establishing learning situation, sequencing teaching contents, innovating teaching models and constructing multiple evaluation system, etc. It implements curriculum teaching in the real manufacturing environment of enterprises, which shorten the distance between schools and enterprises, realizes the curriculum cultivation goal and obtains favorable teaching effect.

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Research on Constructing Index System of Talents Evaluation for Science and Technology Enterprises

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Abstract. A lot of domestic and international practice shows that science and technology enterprises are increasingly becoming important body of developing high-tech industries and establishing national innovation system. What's more, science and technology enterprises are fundamental strength to promote industrial upgrading and improve comprehensive competitiveness. The most important driving force of companies is human resources. The key for enterprises to maximize the value of talents is to have a sound, scientific and reasonable evaluation mechanism. Based on gathering abundant abroad and domestic data, this article proposes some principles that science and technology enterprises should follow to construct scientific and rational index system of talents evaluation. Combined with the characteristics of science and technology enterprises, it constructs talents evaluation model for science and technology enterprises with AHP(Analytic Hierarchy Process) and Fuzzy Comprehensive Evaluation for reference.

Keywords: Talents evaluation, Analytic hierarchy process, Fuzzy comprehensive evaluation, Science and technology enterprise.

Introduction

Knowledge is the main production factor and core competitiveness in science and technology companies. Scientific and rational talents evaluation mechanism is the foundation of their human resource development and management. Talent evaluation is an ancient and young science. And there were the ideas and practices of talents evaluation a long time ago. However, the theory and technology of modern and science talents evaluation have come into being since the 20th century. A large number of scholars have made much research on the techniques and models and there are a lot of advanced evaluation methods, such as evaluation center technology. What's more, they have been applied in practical management and it has made great profit. Since the reform and opening up, on the basis of introducing foreign talents evaluation model our experts and scholars have independently developed proper evaluation model combined with the actual condition of our companies. But there are still some problems. We should make further research on

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these problems. In our science and technology enterprises, there are many technical personnel who are engaged in scientific research and technology service. So the talents evaluation index of these companies should be different from others. Now relevant study on these companies is not enough and they are mainly limited within theory discussion without comprehensive evaluation system.

1 Construction Principles of Talents Evaluation for Science and Technology Enterprises

1.1 Principle of Reflecting Essence Conduct

Essence conduct refers to some basic behavior that can reflect the main requirements of one post. Some elements can reflect the special nature of one job in a certain extent. So we should have different talent assessment index among different positions and different levels. Therefore, when we choose evaluation index and construct evaluation model we should choose corresponding index considering different evaluation aim and object.

1.2 Principle of Independence

First, the meaning of evaluation index can't be too close. It will cause evaluation repetition if their meaning is so close. And this will waste human resources, material resources and financial resources. What's more it will amplify or lessen one aspect of talents' conduct artificially and it will affect overall evaluation results. Second, index should not be included each other. It will cause thought and operation disorder inevitably if index is included each other. And this can't evaluate talents objectively.

Principle of Conciseness. This principle is that the number of evaluation index is neither too much nor too little on the premise of guaranteeing evaluation quality. It can't reflect actual performance level of one person effectively if the number is too little. And it will be unscientific and easy to repeat if the number is too much.

Principle of Popularity. This principle is that the connotation and extension of every index are very clear. The formulation of evaluation index is limpid and common and we should avoid obscure meaning, technical words and extreme terms[1].

2 Choose Talents Evaluation Index for Science and Technology Companies

We should select reasonable evaluation index in order to evaluate talents, for this is basic and important step. Index has direct impact on evaluation reliability and validity. So we select evaluation indicators according to actual condition following above principles, as shown in table 1.

3 Determine Index Weight with AHP Method

AHP can combine quantitative analysis with qualitative analysis effectively and it has many characteristics such as clear in formulation, simple in method and wide in application. Specifically, the general steps of AHP are as follow.

Establish Hierarchical Frame Composed by Target Layer, Rule layer and Program Layer on the Basis of Analyzing the Relationship among Various Factors in Evaluation System. Business goals depend on the joint efforts of all staff. The quality and performance of every employee have a direct impact on the overall effectiveness. We choose comprehensive performance of talents as target layer and denote it by A. Every factor of rule layer reflects one aspect of talents' overall performance. On gathering a lot of information, this paper determines evaluation index from virtue, intelligence, skill and achievement. We use B to express them. Every factor of program layer makes specific description on evaluation object. Specific index is shown behind. We use C to express program layer.

Compare Various Factor on the Same Level with above Criteria and Get their Relative Importance. We should use proper value to express the results and get judgment matrix. In this article, we use the method of Nine-scale judgment[2].

Calculate Relative Importance Vector among Every Factor and Upper Element.

Prove Consistency. First, we should calculate consistency index as Eq.1 and Eq.2.

$$\lambda_{\max} \approx \frac{1}{n}\sum_{i=1}^{n}\frac{(AW)_i}{W_i} = \frac{1}{n}\sum_{i=1}^{n}\frac{\sum_{j=1}^{n} a_{ij}W_j}{W_i} \tag{1}$$

$$CI = \frac{\lambda_{\max} - n}{n-1} \tag{2}$$

Second, we can find corresponding random index according certain table. Finally, we should calculate consistency ratio as Eq.3.

$$CR = CI/RI \tag{3}$$

If consistency ratio is smaller than 0.1, we think the consistency is satisfying. Otherwise we should adjust or reconstruct judgment matrix.

Determine Total Sequence and Calculate Weight. By upper calculation we can get weight vector between a group of elements and their upper factor. We should get sequence weight of every factor especially the lowest layer in total goal. We can get total sequence weight by synthesizing every single weight.

4 Construct Talents Evaluation Model Based on Fuzzy Comprehensive Evaluation for Science and Technology Companies

Fuzzy comprehensive evaluation makes a comprehensive decision on the object evaluated considering many factors in fuzzy environment. Its main steps are as following.

Construct Factor Set of Evaluation Object. Factor is various properties or performance of object evaluated. In different occasions, they are also called parameters. They are integrated to reflect the quality of the object evaluated. We can give an assessment of the object based on these factors. These factors have different degrees of ambiguity usually.

Construct Evaluation Set of Evaluation Object. Evaluation set is composed of various evaluation results that evaluators may make. We use excellent, good, medium, passed and failed to express them generally.

Construct Weight Set. In factor set, the importance of various factors is different. We should give certain weight to various factors in order to reflect the quality of one object. We use W to express the composition of weights. Weights satisfy the character of normalization and non-negative.

Determine Affiliation and Evaluation Matrix. We should identify affiliation relationship between various elements in factor set and evaluation set and construct membership function. We should identify their membership degree. Individual factors constitute a fuzzy evaluation vector. All single-factor fuzzy evaluation vector constitutes the single factor fuzzy evaluation matrix[3].

Fuzzy Comprehensive Evaluation. We can get fuzzy comprehensive evaluation index by fuzzy calculation with single factor fuzzy evaluation matrix and weight set of various factor.

Empirical Analysis of Talents Evaluation for Science and Technology Enterprise

Now we will evaluate one talent in the department of automatic control of Xindatong Company in Shandong province with above evaluation model.

Choosing twenty estimators including leaders, colleague and experts we can get every index weight with specialist grading method according to their working experience. And we use excellent, good, medium and bad to express them. The weight of every factor is shown in table 1.

Table 1. Weight of every evaluation factor

Target	First index	Weight	Second index	Weight
Talents Evaluation System (A)	Virtue (B_1)	0.5501	Commitment to work (C_1)	0.648
			Coordination skill (C_2)	0.2299
			Pioneering spirit (C_3)	0.1222
	Intelligence (B_2)	0.0561	knowledge breadth (C_4)	0.122
			professional standard (C_5)	0.6484
			foreign language proficiency (C_6)	0.2296
	Skill (B_3)	0.1341	organizational capability (C_7)	0.0694
			innovative ability (C_8)	0.5501
			learning ability (C_9)	0.3147
			expressive capacity (C_{10})	0.0657
	Achievement (B_4)	0.2597	work quantity (C_{11})	0.12196
			work quality (C_{12})	0.5584
			working efficiency (C_{13})	0.3196

We design specialized questionnaire and give them to experts. We can get fuzzy judgment matrix by gathering the results of all experts. And we can get fuzzy comprehensive judgment.

$$B_1 = W_1 \bullet R_1 = (0.648,0.2299,0.1222) \bullet \begin{bmatrix} 0.3 & 0.6 & 0.1 & 0 \\ 0 & 0.4 & 0.4 & 0.2 \\ 0 & 0.5 & 0.3 & 0.2 \end{bmatrix} =$$

$$(0.3,0.6,0.2299,0.2)$$

$$B_2 = W_2 \bullet R_2 = (0.122,0.6484,0.2296) \bullet \begin{bmatrix} 0.3 & 0.4 & 0.2 & 0.1 \\ 0.1 & 0.8 & 0.1 & 0 \\ 0.1 & 0.6 & 0.3 & 0 \end{bmatrix} =$$

$$(0.122,0.648,0.23,0.1)$$

$$B_3 = W_3 \bullet R_3 = (0.0694,0.5501,0.3147,0.0657) \bullet \begin{bmatrix} 0.1 & 0.5 & 0.3 & 0.1 \\ 0.2 & 0.4 & 0.3 & 0.1 \\ 0.4 & 0.6 & 0 & 0 \\ 0.2 & 0.4 & 0.3 & 0.1 \end{bmatrix} = (0.3147,0.4,0.3,0.1)$$

$$B_4 = W_4 \bullet R_4 = (0.12196,0.5584,0.3196) \bullet \begin{bmatrix} 0.1 & 0.6 & 0.3 & 0 \\ 0.2 & 0.5 & 0.2 & 0.1 \\ 0.1 & 0.4 & 0.4 & 0.1 \end{bmatrix} =$$

$$(0.2,0.5,0.3196,0.1)$$

Finally we can get comprehensive evaluation results of this talent.

$$B = W \bullet R =$$

$$(0.5501,0.0561,0.1341,0.2597) \bullet \begin{bmatrix} 0.3 & 0.6 & 0.2299 & 0.2 \\ 0.122 & 0.6484 & 0.23 & 0.1 \\ 0.3147 & 0.4 & 0.3 & 0.1 \\ 0.2 & 0.5 & 0.3196 & 0.1 \end{bmatrix} =$$

$$(\ 0.3,0.5501,0.2597,0.2\ )$$

From the result we can draw a conclusion that the comprehensive evaluation rank of this talent is good by maximum membership principle.

5 Summary

Talent evaluation for science and technology companies is one complex and dynamic system. We should invest a lot of manpower, material and financial resources in designing index and weight of evaluation system to ensure that evaluation is scientific, advanced, reasonable and practical. There is no fixed evaluation model. Evaluation index and the weight of every index should be different according to different evaluation goal, different evaluation object and different job.

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Study on the Innovative Education in Geometric Tolerance

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Abstract. Geometric tolerance is an important technical requirement in the engineering drawings, which is also one section of the professional knowledge in mechanical engineering. To overcome the shortcomings of the diagrammatic representation for geometric tolerance in the national standard or mostly teaching materials, it was proposed to focus on tolerance characteristics, applying two innovative concept "DOF plane" and "shape expansion", which make beginners easily to grasp the concept of geometric tolerance, difference and application in the case of less professional knowledge. For an ideal line, each plane through this line represents a "DOF plane"; The so-called "shape extension" is tolerance zone shape which is understood the ideal elements as quantitative (tolerance value) the expansion effect in the direction of errors.

Keywords: Geometric tolerance, Innovation, DOF plane, Shape extension.

1 Introduction

The performance of mechanical products is ensured by geometric tolerance (the shape and position tolerances), which are given in part drawing. Geometric tolerance set produced by in the scope of the allowable shape and position changes error when processed the parts [1].

National standards GB/T1182-2008 "Geometrical Product Specifications (GPS) Geometrical tolerance, shape, orientation, location and run-out tolerance" use graphic example to illustrate straightness, flatness, parallelism, perpendicularity, run-out, etc. fourteen geometric tolerance projects, while this section's contents in all kinds of related teaching materials are quoted from national standards and few comments and addition. These inevitably bring about the following issues:

① There are many graphic examples but few expression to its conceptual meaning and it is not easy to understand;

② Using examples introduce tolerance project, which will inevitably miss a lot of common or special circumstances;

③ The high requirements are put forward to the preliminary technical staff, and the spatial imagination and the availability of a wealth of practical experience in

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production determine their understanding of the meaning of each illustration and practical application accuracy.

The author attempts to reform the geometric tolerance teaching, and proposes “DOF plane" and "shape extension" two innovative concepts, which make beginners easily to grasp the concept of geometric tolerance, difference and application in the case of less professional knowledge.

2 DOF Plane

Shape is not only the most important characteristics in the four tolerances but also the students most feel uncertain. It mainly reflects the practical elements changes of two-dimensional or three-dimensional space (geometric tolerance zone) according to the part of the functional requirements. For the points and surfaces, it is easy to understand tolerance zone shape: the point of two-dimensional error space is round, and three-dimensional error space is ball; the inclusion surface area is two parallel planes; for the line which mainly refers to contour line and center line, its tolerance zone shape is the most troubled to students. It is very difficult for the students who are less contact to the actual production to understand from the actual change regional perspective.

Based on the above consideration, it may be another sense to understand the actual change regional perspective as a DOF problem: For an ideal line, each plane through this line represents a DOF plane, which is shown in fig.1. The only two DOF plane are drawn in the figure, Of course, there can be numerous planes through the line, and this quantitative numerous regional plane constitute the line of any possible change in the actual space.

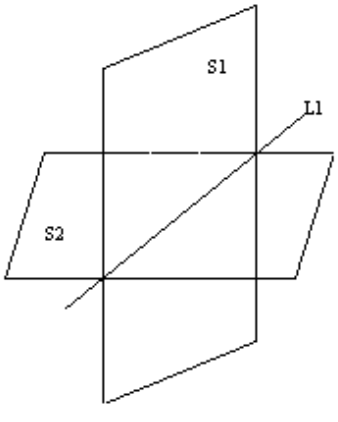


Fig. 1. Schematic diagram of Line’s DOF plane

Compared the DOF plane concepts with the national standards legend [2] described, as listed in Table 1.

Through the teaching application, students from the "DOF plane" learn tolerance zone formation, so they can clearly understand the given comments of the national standard legend.

3 Shape Extension

In teaching, the author provides a more convenient way to understand the shape extension, and the new method has made its premature place, so the author put forward it to discuss with each other. The so-called shape extension zone is tolerance zone shape which is understood the ideal elements as quantitative (tolerance value) the expansion effect in the direction of errors.

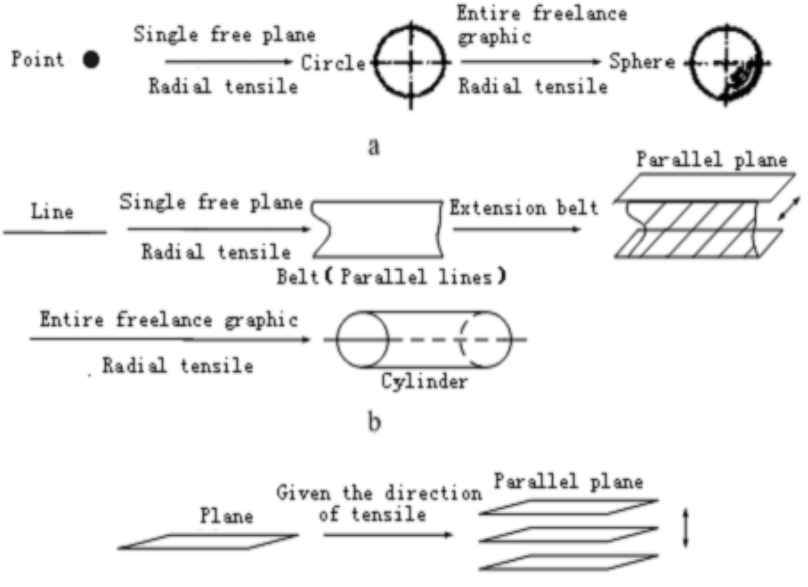
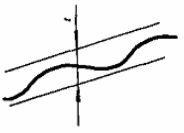
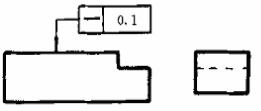
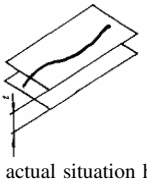
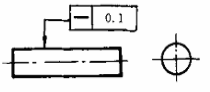
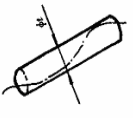
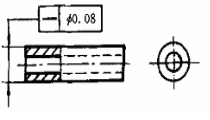


Fig. 2. Shape extension diagram of geometric elements

In fig. 2: round tolerance zone is formed when the point does the single-DOF plane of the radial expansion, and ball tolerance zone is formed when the point does full-DOF plane of the radial expansion, which are shown in fig.2a;belt tolerance zone (the region of two parallel lines) is formed when the line does single-DOF plane expansion, then the pipe tolerance zone is formed when the belt extend in the vertical direction (two parallel planes) and the line does the full-DOF plane of expansion, which is shown in fig.2b; the area between a pair of parallel planes is formed when surface expansion is formed in the given direction.

Table 1. Description compare of straightness tolerance

Straight lines tolerance between the two parallel line regions	GB Legend	In a given plane, tolerance zone is the distance of tolerance value t the area between the two parallel lines 	The measured surface of lines between adjoining planes must perch parallel to the shown pattern projection plane and distance of tolerance value 0.1 the area between the two parallel lines 
	DOF illumination	When the actual situation is only along one DOF plane changes or only study of its plane projection in a given DOF plane, its minimum zone tolerance can be used by the distance in the plane as the two parallel lines of tolerance value.	
Straight lines tolerance between the two parallel plane regions	GB Legend	In a given plane, tolerance zone is the distance of tolerance value t the area between the two parallel planes 	The measured cylindrical surface of lines between adjoining planes must perch the distance of tolerance value 0.1 the between the two parallel planes 
	DOF illumination	When the actual situation has a certain amount of requirements only along one DOF plane changes (not ask or concerns in the other DOF plane), its minimum zone tolerance can be used by the vertical the DOF plane of the two parallel planes, while the distance between two parallel planes is volume requirements in the DOF plane.	
Straight lines tolerance contained by the cylinder	GB Legend	If Φ is added before the tolerance value, The tolerance value is the cylindrical surface regions of the diameter t 	The axe of the measured cylindrical surface must perch the tolerance value Φ0.08 in the cylindrical surface area 
	DOF illumination	When the actual situation has the same amount of demands in all DOF planes, confined Space is the combined effects of all the DOF plane (the ideal straight line as the axis of the cylinder), while the diameter Φt of cylinder represents the volume requirements.	

4 Example Applications

Through the two concepts "DOF plane" and "shape extension" and mastering the basic shape of tolerance zone, the beginners can independently further study all tolerance projects according to benchmark relationship (parallel, vertical, position etc.).

Taking orientation tolerance zone for example, the relationship of DOF plane, the direction of tolerance zone and the direction of orientation tolerance zone must be firstly understood: In general, the direction of tolerance zone refers to the direction of tolerance values, and that is a given direction or the vertical direction of the

measured elements; DOF plane is all the possible changes direction of the point, line, surface and other elements, and it is covered with the direction of tolerance zone, and the direction of tolerance zone is provided a quantitative requirements DOF plane; orientation tolerance zone "direction" refers to the relationship of the direction of the required DOF and benchmark line, which also influence the shape of tolerance zone.

Example: In fig. 3, requires that vertical tolerance 0.01 mm is marked the axis of φD relative to 2-φd public axis.

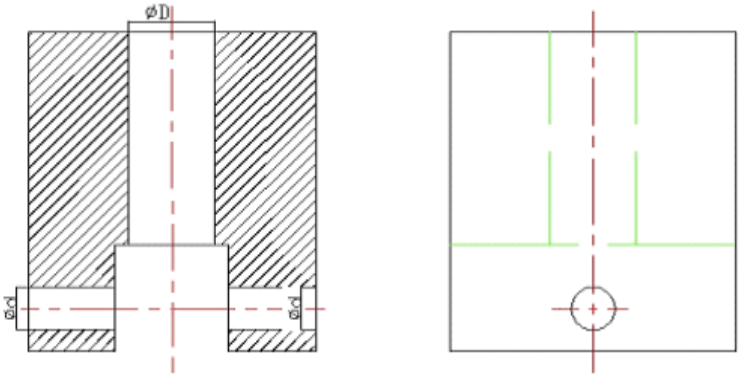


Fig. 3. Geometric tolerance instance

Analysis: the labeling "φ" before tolerance value "0.01" judged the problem of tolerance zone shape. First, the tolerance zone of φD axis geometric factors is two parallel lines area, two parallel planes area or a cylindrical surface area. Proposing the vertical degree requirements which the premise requires is that vertical relationship of its tolerance zone and 2-φd public axis must be formed, and this problems will be come down to establish the vertical relationship three kinds of shapes and benchmarks or not: The φD axis cylindrical tolerance zone from the DOF plane and the view point of shape expansion is whole DOF plane radial expansion. However, only one of these DOF plane form vertical relationships with 2-φd public axis, so cylindrical tolerance zone can not put forward vertical requirements. Therefore, the "tolerance value of 0.01mm" will only reflect on a value of a pair of parallel lines or parallel planes distance, and its former cannot mark "φ".

5 Conclusions

In the teaching of geometric tolerance, the two innovative concepts "degree of freedom plane" and "shape extension" are used to solve important and difficult problem to reach the purpose of "teach students how to fish". This situation can help beginner easily grasp geometric tolerance purpose concept, difference and

application, and obtain good teaching effects in the case of less professional knowledge.

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Analysis on Teaching in Course of "Architecture Structure" of Engineering Management Major

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Abstract. Engineering management major is an emerging cross and compound subject of engineering and management, "architecture structure" is an important course of the engineering management major. But the main content of "architecture structure" is about of structure, so teaching is should be adapt to the engineering management major. Based on the characteristics of engineering management major the article analyzed the problems in teaching and the corresponding measures.

Keywords: engineering management major, architecture structure, content of courses, teaching objectives.

1 Introduction

The "architecture structure" course is a technology and basic course of engineering management major, and the content include three types of construction such as reinforced concrete structure, masonry structure and steel structure, also involve part of foundation and anti-seismic. Coverage is wide and content is various, for the student of engineering management major it have difficulty in grasping the design theory and calculation method comprehensively. With the deepening of the education teaching reform, teaching hours are dwindling. Under the circumstances that how make the student of engineering management major understand and grasp the architecture structure theory is worth educational worker to discuss deeply.

2 The Understanding of Teaching in Course of "Architecture Structure"

Teaching objectives decide the content of courses, making teaching goal should have pertinency. The graduates of engineering management major are mainly engaged in

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technical work in the forefront of production such as construction, installment, management and maintenance of equipment, thus which require the ability of correctly understanding the working drawing and analysis and solve ordinary structure problem in practical engineering.[1] Aim at the cultivating of station capacity, should gradually strengthen the capacity of understanding the working drawing through design calculation of reinforced beam and board and column in the part of concrete structure.

2.1 Optimize the Composition of Content of Courses

Content of courses should insist the principle of "indispensable, enough" and strengthen emphasis and reduction difficulty. For the student of engineering management major, the emphasis should build the structural concept and grasp the design procedures and detailing requirements of basic building block, so the content about which should be teach clear and thorough. For example, in RC beam and slab structure the mechanical characteristics of the cast-in-place one-way slab girtstrip floor system should not be explained more deeper and the detailing requirements should be teach as emphasis so as to the students grasp the emphasis.

Strengthen structural construction teaching. The structure simplified calculation method general considered the loads only and it is difficult to use formula to express other effects. Structural measures is the technical measures adopted to the factors is failed to consider in detail or are difficult to quantify in structural calculation, it and structure calculation supplement each other and are equally important two aspects in structural design. In practical engineering, quality accident caused by tectonic processes improper is not rare. So in teaching should strengthen structure teaching and let students understand the mechanics of truth.

2.2 Run through Technical Specifications Consciousness in Teaching Process

Technical specifications, also called technical standard, divided into the national standards and industrial standards. In order to reflect the latest theory of concrete structure subject research and engineering design practice experience, the functional departments such as national construction ministry would modify or supplement the content of the standards have already been issued every several years. So in the teaching of "architectural structure" should be paid attention to and strengthen the training of students' technical specifications consciousness.

In teaching students should be attention to the following points: (1) correctly understand and implement "the compellent items" in the existing technical specifications. "The compellent items" is the important terms directly related to people's life and property security, human health, environmental protection and other benefits in the current construction of national standard and professional standard and is the important measures to implement the state council "construction engineering quality management regulations" and "the standardization law, and activities parties (construction, design, supervision and construction) participate in the engineering construction must resolutely implement.[2] Let the students realized that the quality is the life and the standard is core of engineering quality. (2) Correctly

understand and use the current specification stipulated terms, symbols rules and measurement unit. Require students strictly following the provisions of the code of various symbols and using international standards organization unified unit of measurement and expression way in teaching interact, assignments and in the course design, eliminate the bad phenomenon such as saying specious "jargon", coined "symbol" and use the standard unit of measurement etc.. (3) Understand general rules of "safety and applicable, advanced technology, reasonable economy" in specification. In the teaching process repeat to stress that must insist on security is the first principle in construction structure design and consider saving is in the premise of have enough safe reserves only have practical significance. Let the students grasp the safety and economic relationship systematic.

3 Existing Question

The architecture structure course is a professional technology applying mechanics theory knowledge to solve practical problems in construction engineering. Course structure design is very complex and computational formula is very much, and has a lot of problem need to be understood, analysis and design excellent-choosing. All these require the students to understand the meaning, grasp the formula’s application conditions and can use calculate manuals and standards and specifications for structure design correctly. For the engineering management major’s students, the relatively weak of engineering mechanics knowledge would make them feel a little daunting in the course, which greatly influenced their study interest and the comprehensively improve of teaching quality.

Building that students usually see mostly is reinforced concrete structure and masonry structure, steel structure building is less, and the status of structural seismic is imagine in the head. Even common reinforced concrete structure and masonry structure, the understanding are more about architecture function and image aspects, and lack of necessary perceptual knowledge about structure.

4 Teaching Method

The architecture structure course is more theoretical and practical and learning boring, how make the lack of vitality words "reinforced, concrete, brick" alive up"? Interest is the best teacher," students will produce strong desire to seeking knowledge under the interest. (1) Laced with classical allusions, adjust the classroom atmosphere. The content of structural course includes much basic lesson, especially mechanical knowledge. So for years students generally think structure lesson is difficult to learn. Which caused part students lose learning motivation and interest, thus establish confidence is vital. Such as in teaching steel structure, can make students to understand the wide application of the steel structure through example, and let students understand the steel structure is the main trend of the development of architectural structure from the point of Green initiative. Such students had brand-new understanding to steel structure, and produced desire to seek knowledge. (2) Constantly settings suspense. Teachers should set suspense

around central subject when he was preparing the classroom lessons, and ask questions around suspense continually and encourage students to put forward its own views on bold, thus enables the students turn passive accept knowledge to the active thinking.

4.1 Pay Attention to Understanding of the Basic Concept

The basic concept is the premise of logical reasoning, judgment, analyzing and solving problems, but also is an important part and segment to understand the course.

If the concept learning is indefinitely and know a little, that will cause the process of learning "vicious circle". Such as the load's design value is the load's standard value multiplied by load's partial coefficient, and the materials strength's design value is the materials strength's standard value divided by material subentry coefficient. If not understand the two concepts clearly, can not write bearing capacity limit state basic combination design expression accurately so that can not correctly using formula to solve building structure and structural components section design problem. So should pay great attention to conceptual understanding and highlight the necessity and the importance of basic concepts, and establish foundation for the future study.

4.2 Increased the Practical Teaching Link

At present, in the architectural structure course the theory teaching hour is more than practical teaching hour, in addition the time of architectural structure course is arranged in the fourth and fifth semester and before the semester students rarely have the opportunity to see the construction site. Recommend should lead students to more typical construction site and explain on the site for one or two weeks before learning the architectural structure course in class, which will help students to learn and understand the content and improve the teaching effect.

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Focus on Form Instruction—Theoretical Review of Research Abroad

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Abstract. FOF instruction, which incorporated certain degree of attention to form into primarily meaning-focused context, has become a hot research issue in the field of SLA. This paper intends to review the theoretical research abroad in terms of FOF instruction. The definition, types, cognitive foundations of FOF instruction will be respectively presented which might offer some pedagogical implications for teachers at home. The key point in the FOF instruction is how to allocate learners' focal attention to meaning and linguistic forms. Learners' fundamental focus should on meaning, and incidental focus should be directed to linguistic forms when comprehension is affected by the non-target-like utterances. FOF instruction, in terms of types, can be divided into planned FOF and incidental FOF. The cognitive bases which motivate FOF instruction are Interaction Hypothesis and Noticing Hypothesis.

Keywords: Focus on Form, Interaction Hypothesis, Noticing Hypothesis.

1 Introduction

Long claimed that pedagogical instructions could be classified into three types according to what was required to be focused on, forms, meaning or an integration of forms and meaning. For a long period of time before 1970s, language was treated as isolated grammatical items in SLT. That is to say, only linguistic forms were focused on without meaning engaged. But in the 1970s, educators pointed out that learners could master linguistic features and were able to make accurate sentences, but they could not use the language fluently in communication. Gradually, grammar-centered instruction was depreciated by linguists and foreign language teachers. In the late 1970s and early 1980s, came the meaning-focused instruction, such as the Natural Approach, in which great emphasis was placed on communication without attention assigned to the linguistic features. The Meaning-focused instruction which purely emphasized the importance of communication of meaning became popular. However, in the mid-1980s, researchers noted that learners were instructed to communicate fluently at the expense of accuracy with the meaning-focused instruction. Swain pointed out that some studies showed learners could not be enabled to reach high levels of accuracy in grammar with the

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immersion program which was based on FOM. Since the early 1990s, FOF instruction, which incorporated certain degree of attention to form into primarily meaning-focused context, has become a hot research issue in the field of SLA. Long recommended a third type of teaching syllabus which was termed "focus on form" for the other two types of syllabus, FOFs and FOM, are inadequate. Under FOFs instruction, the communicative ability is neglected; under FOM instruction, the grammatical accuracy is neglected. While under FOF instruction, both the communicative ability and grammatical accuracy are emphasized. Linguistic forms are presented in a context by an indirect way, not an overt, teacher-led way.

2 Definition of FOF

Long has given two versions of definitions of FOF. The first version is defined as follows[1]:

Focus on form…overtly draws students' attention to linguistic elements as they arise incidentally in lessons whose overriding focus is on meaning or communication.

The second version is defined as follows[2]:

Focus on form often consists of an occasional shift of attention to linguistic code features---by the teacher and/or one or more students---triggered by perceived problems with comprehension or production.

It can be noted that the second definition, compared with the first one, is less theoretical, offering researchers and English teachers more specific applicability for classroom teaching. Ellis indicates that "a focus on form can be achieved in two principal ways. First, activities can be devised that require learners to communicate while also focusing their attention to specific formal properties. Second, teachers can elect to provide corrective feedback on learners' errors during the course of communication activities." [3] It can be learned from his statement that there are two main ways to temporarily get learners' attention to linguistic features. One is to design activities in which learners need to communicate and also are directed to pay attention to formal aspects, the other one is recasting. During the course of meaning-based communication, recasting does not have a negative effect on the mutual understanding.

The FOF instruction represents that both form and meaning are focused on, though there is difference in the degree of focus. Meaning is the usual and fundamental focus and form is just focused incidentally. FOF is a type of instruction that, on the one hand, is aimed at pushing learners to produce meaningful texts fluently, and, on the other hand, pushing learners to speak in accurate linguistic forms. The primary attention is oriented to meaning and communication, and focus is shifted briefly while grammatical problems occur in the process of communication.

3 Types of FOF

Different researchers have different views about types of FOF. Long stated that FOF was incidental. Doughty and Williams claimed FOF included proactive FOF and reactive FOF, the former "entailing selecting in advance an aspect of the target to focus on", while the latter "requiring the teacher notice and be prepared to handle various learning difficulties as they arise" [4]. That is to say, proactive FOF assumes that focus on a linguistic form in the L2 classroom is planned in advance while reactive FOF assumes that focus on a linguistic form is incidental. Ellis et al. further classified FOF. First, FOF was divided into planned FOF and incidental FOF. Planned FOF, just like the proactive FOF put forward by Doughty and Williams, means that a linguistic form is focused on in the meaning-based L2 context with advance preparation, while incidental FOF means a linguistic form is focused on without advance preparation. Incidental FOF is further divided into preemptive FOF and reactive FOF. The former means that a linguistic form is chosen as the topic of conversation by the L2 teachers or learners even if no mistakes in this form have been made; the latter means that mistakes in a linguistic form are responded to by the teacher or other students when they are made by L2 learners during the course of communication. Reactive FOF can be subdivided into conversational and didactic in terms of the content. The former means that L2 learners' formal mistake is responded to by the teacher during the course of communication when the mistake leads to an understanding problem; the latter means that L2 learners' formal mistake is responded to by the teacher even if there is no difficulty in understanding what the learner has said. Thus conversational involves "negotiation of meaning" while didactic involves "negotiation of form". Reactive FOF can also be subdivided into implicit feedback and explicit feedback in terms of manner. The former means that L2 learners' formal mistake is responded to by the teacher or other learners and pointed out in an indirect way, usually via recast; while the latter means that L2 learners' formal mistake is responded to by the teacher or other students and pointed out in a direct way.

4 Cognitive Foundations of FOF

The cognitive foundations which motivate FOF instruction are Interaction Hypothesis and Noticing Hypothesis.

4.1 Interaction Hypothesis

Interaction Hypothesis is defined by Long as "It is proposed that environmental contributions to acquisition are mediated by selective attention and the learner's developing L2 processing capacity, and these resources are brought together most usefully, although not exclusively, during negotiation for meaning. Negative feedback obtained in negotiation work or elsewhere may be facilitative of SL development, at least for vocabulary, morphology and language-specific syntax, and essential for learning certain specifiable L1-L2 contrasts." [5] It can be learned

from the above statement that negotiation for meaning plays an important role in SL learners' process and acquisition of target language. Negotiation is effective in facilitating SLA between learners and other SL speakers, especially between learners and more proficient SL speakers, and between learners and elaborated written articles. During the course of negotiation, corrective feedback may be provided by ESL teachers or other learners, which reformulates learners' non-target-like utterances without his intended meaning changed. Learners' attention can be attracted to mismatches between TL and IL and form-meaning relationships. That is to say, a linguistic form is focused on via negative feedbacks. Then learners will modify their non-target-like utterances and produce target-like words. Interaction has a positive effect in facilitating SLA.

4.2 Noticing Hypothesis

Noticing Hypothesis, advanced by Schmidt, claims that learners must incidentally focus their attention on forms to better acquire second language. Schmidt proposed that noticing is "the necessary and sufficient condition for the conversion of input to intake for learning" [6]. The prerequisite for SL learners' processing of a linguistic form is learners' awareness of the particular form. Only when a linguistic form is noticed in the input by the SL learners, may a cognitive processing of the linguistic form take place.

Learners' notice plays a crucial role in language acquisition. Cognitive comparison of input and IL and joint processing of form, meaning and function can occur in the short term memory via noticing. When it is noted that the form in the input expressing one meaning is not consistent with the form in IL, new information in the input is processed and matched up against the existing internalized knowledge structures. When it is noted that one form, based on the context, is selected to express one meaning, the form-meaning-function mapping is constructed. Cognitive schemas in IL are restructured. The target forms are internalized into the developing system. Input is converted into intake. Learners' output will then be closer to the input. Thus noticing can help learners understand and intake L2 input. Noticing is the essential condition for learners to acquire foreign language accurately.

Noticing Hypothesis can offer a partial explanation why compared with the FOM instruction learners under the FOF instruction can communicate fluently and accurately. Under the FOM instruction, only meaning is focused on and no ways are adopted to attract SL learners' attention to the linguistic forms. While under the FOF instruction, a linguistic feature in the input may be noticed, processed and learned by SL learners via input enhancement or feedbacks during the course of meaning-based communication. During the process of interaction, selective attention to the target forms can be facilitative in acquiring the target forms in SL. With the help of input enhancement and feedbacks, differences between IL and TL and forms and meanings of the English voice can be noticed. Noticing is an essential condition of acquiring English voice.

5 Conclusion

FOF instruction is a new theory in 1990s which has been a hot issue in the field of pedagogical instructions of second language acquisition. A mass of theoretical research results have been achieved which provide the theoretical support for experimental studies. So far, some empirical studies related with FOF have been performed in terms of timing, classroom setting, forms needed to focus on and ways to get the learners' attention. These experimental researches should also be reviewed to find out the merits and demerits of the operations, which can provide pedagogical implications for future research.

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Background and Introspection of Higher Vocational Education Reforms in China

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Abstract. There are many problems about higher vocational education reforms of china. Figure 1 shows that higher vocational education has become half of higher education, played an important role in popularization of higher education in the beginning of the twenty-first century. Figure. 2 shows that number of colleges and universities graduates was from 1790.5 thousand in 1999 to 7626.2 thousand in 2009, with increasing employment pressure. Analysis of higher vocational education reforms in china, there are major problems, such as separation of teaching and learning, lack of coordination of teaching and cultivating, and the disharmony of general characters of specialty construction and personality of student's career development, will provide person related to engineering education reforms with important reference.

Keywords: vocational education, cultivating, career development, engineering education.

1 Introduction

After the third national education conference made a decision on accelerating the development of higher vocational education, entering a phase of vigorous development, by 2009 the national number of enrolment in vocational colleges reached to 9.648 million, an increase of 8.2 times in 1999. At the same time, china is facing with the difficult task of economic restructuring, higher vocational education reforms is urgent. Since Ministry of Education issued about some suggestions of comprehensively improving quality of teaching and education on higher vocational education in 2006, higher vocational education reforms has made great achievements, meanwhile, there are some problems and even fundamental questions, it is necessary to introspect higher vocational education reforms in order to promote rapid and healthy development.

2 Background of Higher Vocational Education Reforms

2.1 Status of Higher Vocational Education

At present, higher vocational education for academic qualifications belong to special course education, mainly including specialized higher education schools and tertiary

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vocational-technical colleges, without regular course education and graduate programs. Higher vocational education is a “historical necessity” and “realistic option” beginning of china's reform and opening up[1]. Short-cycle colleges conducts higher vocational education, which includes specialized higher education schools, tertiary vocational-technical colleges and short-cycle courses provided by adult higher education institutions. There were 1215 institutions in china in the end of 2009, of which: tertiary vocational-technical colleges 1071 institutions. Entrants is 3,133.851 thousand persons of short-cycle courses by regular institutions of higher education in 2009, enrolment 9,648.059 thousand persons, graduates 2,855.664 thousand persons. According to national outline for medium and long-term education reforms and development (2010-2020), number of enrolment of higher vocational education had 12.8 million persons in 2009, 13.9 million persons in 2015, 14.8 million persons in 2020.

Figure 1 shows that higher vocational education entrants accounted for the proportion of the total number of regular higher education. higher vocational education has truly become half of higher education, played an important role in popularization of higher education in the beginning of the twenty-first century. At present, over 90% of cities had at least one higher vocational colleges. The rapid development of higher vocational education meets the people's strong demand for higher education, enriching the type of higher education, improving vocational education hierarchy.

2.2 Changes in the Employment Situation

China's economic system gradually changed from planned economy to market economy with the job market changed fundamentally, employers and graduates have been from passive to active, job market supply and demand sides for game. Increasing employment pressure, led to some graduate unemployment. Figure 2 shows that number of colleges and universities graduates changed in 11 years. Number of colleges and universities graduates was from 1790.5 thousand in 1999 to 7626.2 thousand in 2009. Due to the influence of social environment, employment Psychology is undergoing a fundamental change, such as self crisis, Crisis of confidence, value crisis, identity crisis, liability crisis and emotional crisis[2].

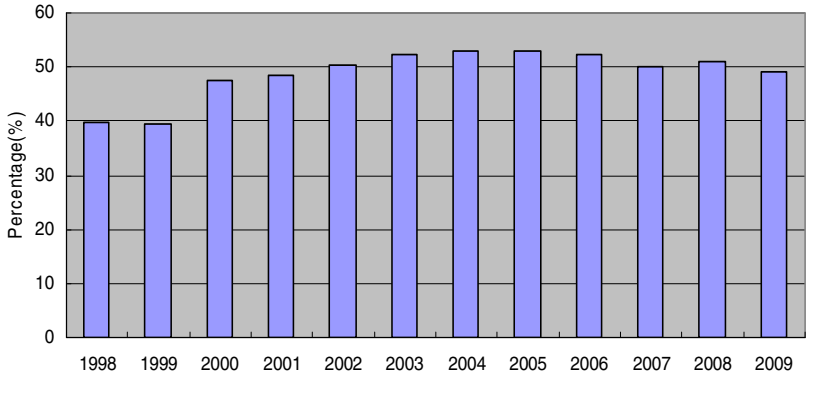

Fig. 1. Higher vocational education entrants accounted for the proportion of the total number of regular higher education.

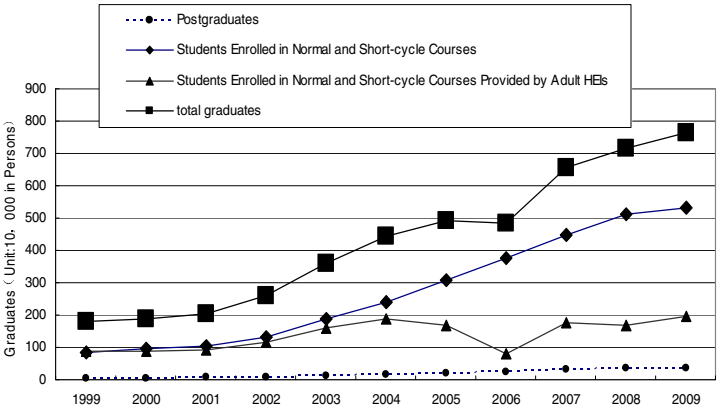

Fig. 2. Number of colleges and universities graduates in nearly 11 years.

2.3 Historical Necessity of Engineering Education Reforms

Engineering, and the innovative development of new goods and services, is acknowledged as a major engine of economic growth and social development. Engineering education has an important objective to attract more students to engineering, educate them with the right skills and knowledge, and then retain them in the engineering profession. China's reform and opening up has been 30 years with rapid economic development, created a miracle in the history of human economic development. But china is also facing the great challenges and opportunities of upgrading and transformation of industry, reform of higher vocational education become an inevitable trend. Talents are essential to industry upgrade, higher vocational college assumes the important task of cultivating engineering talent. The scale of engineering education in china is the largest in the world, but quality of engineering education is very serious. Quantity of engineers can not equate quality of engineering education, quantity can not substitute for quality. Therefore, great efforts to improve the quality of engineering education, is a very important mission of higher engineering education reforms in china, in particular higher vocational education reforms.

3 Introspection of Higher Vocational Education Reforms in China

Ministry of Education issued about some suggestions of comprehensively improving quality of teaching and education on higher vocational education in 2006. Ministry of Education, Ministry of Finance launched and implemented national model building plan of higher vocational colleges by central government funds to support construction of 100 national demonstration vocational colleges, effectively promoted education and teaching reform of national higher education institutions. However, due to stage of economic development, industrial structure

adjustment limit, law of development of higher vocational education, the difficulty of engineering education reform, and, there were also many problems, such as vocational education system defect, unclear characteristics, unclear location[3].

3.1 Separation of Teaching and Learning

Educational process is an organic combination unity integrated teaching with learning, we can really achieve the effect of teaching as long as teaching and learning is in the same direction. At present, higher vocational education in china separated teaching from learning, specialty construction attached great importance to teaching of teacher, ignored learning of student. China has always emphasized and implemented teacher-centered education, rather than student-centered education[4]. If students do not have the desire and motivation to learn, no matter how teachers teach, there will not be teaching effect. Higher vocational education reform has emphasized on what to teach and how to teach, not attached importance to what student want to learn and how to learn. According to national outline for medium and long-term education reform and development (2010-2020), student-centered and teacher- guided, we will give full play to the initiative of students, to promote the healthy growth as all work of school starting and ending points. Therefore, it is necessary to research on characteristics of growth and success of students, in accordance with the laws of physical and mental development of students. According to individual differences of students, we respect for the law of development of students, design appropriate teaching content and choose appropriate teaching methods, meet the needs of students, mobilize the enthusiasm of students, enable students to learn on their own, promote the coordinated development of teaching and learning.

3.2 Lack of Coordination of Teaching and Cultivating

The current definition of education is not completely uniform, in the western country, the word “education” comes from the Latin “educare”, original meaning of “leads” or “export”, meaning that some kind of potential body and mind will be triggered inside out by some means. The only macroscopic characteristics of education is focused on quality and ability of others, and information dissemination activities of impact of their mental or psychological state, usually education mainly is composed of teaching and cultivating, both are indispensable. To take cultivating student as the basis, and moral education as the first problem are the fundamental idea of quality education. Education is a progressive discovering of our own ignorance, the object of education is to prepare the young to educate themselves throughout their lives. John Henry Newman said that university education shows him how to accommodate himself to others, how to throw himself into their state of mind, how to bring before them his own, how to influence them, how to come to an understanding with them, how to bear with them. Higher vocational education reforms in china focused on teaching, neglected cultivating education, teaching process fail to reflect the content and behavior of cultivating education with insufficient attention to student. Because of lack of sufficient knowledge and

skills about education laws and laws of physical and mental development of students, in realistic teaching activities, teacher often teach only the professional knowledge and skills, cultivating education involves little or no content, which is not conducive to the future development of student. There are some main problems of cultivating education about the weakness of humanistic education, unenthusiastic participation of teachers, the separation of performance of cultivating education and distribution system of evaluation, lack of cultivating education system, and so on[5]. Therefore, it is necessary to strengthen the cultivating education of student, to achieve the coordination of teaching and cultivating.

3.3 The Disharmony of General Characters of Specialty Construction and Personality of Student's Career Development

The performance of higher vocational education in china is focusing on specialty construction, which mainly include talent cultivation orientation, curriculum system setup, reform and construction of curriculum, construction of experimental training conditions, teacher team building, management and evaluation of teaching quality, and so on. Currently specialty construction has focused on trainning professional knowledge and skills of students, inadequate attention to cultivation of non-professional capacity, especially career development of student. Career development of some students can be inconsistent with specialty construction or not at all suitable for students, study enthusiasm and initiative will greatly reduce. Therefore, according to individual differences of students, curriculum system and content and teaching methods are designed, in accordance with integration of people-orientation and cultivation-orientation. At the same time, professional teachers have a body of knowledge of career development, which is composed of incentive theory, people-post matching theory, career decision-making theory, and so on. Career development of students should be run through the whole process of specialty construction, career development education should be developed toward the direction of whole course tracing, professionalism and individuation[6]. It is important to career development of students that professional teachers organize and teach professional courses combining professional courses with career development. Specialty construction shall, on the basis of the needs of career development of different student, act on their own in drawing up their teaching programs, compiling teaching materials and making arrangements for their teaching activities, which play an important role in promoting the overall development of students.

4 Conclusions

In past 10 years, higher vocational education in china has achieved rapid development, over 90% of cities had at least one higher vocational colleges, with increasing employment pressure. The scale of engineering education in china is the largest in the world, but quality of engineering education is very serious, with historical necessity of engineering education reforms. Education reforms has entered

a crucial phase, there are the main problems about separation of teaching and learning, lack of coordination of teaching and cultivating, and the disharmony of general characters of specialty construction and personality of student's career development. Promoting the holistic development of students, providing students with proper education, which is the fundamental objective of higher vocational education reforms.

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Searching a "Work-Integrated Learning" Teaching Practice for the Mould Professional Course

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Abstract. An innovative situational teaching for "work-integrated learning" was carried out in the higher vocational school for the course of "punching process and mould designing". Taking the mould designing and manufacturing professional students for object, by profound cooperation between school and enterprise for supporting platform, based on the working process oriented, develop a "work-integrated learning" characteristic of skilled personnel training programs, and to search the teaching implementation, achievements, problems and suggestions are discussed in this paper. The trained students' professional skills and comprehensive quality is obvious superior than other training modes on the work. It has been shown that the talent cultivation mode of "work-integrated learning" is a suitable and effective talents training mode among the present education.

Keywords: Mould Professional, Work-Integrated Learning, Situational Teaching.

1 Introduction

There are many core courses for mould professional students in the higher vocational school; these courses have the obvious characteristics, such as strong engineering nature, strong practical, abstract content, and complicated mould structure. For a long time, the curriculum teaching method is usually finished the theoretical knowledge first in class, then performing the experiments, curriculum designing, mould-designing and writing technological process for mould parts. The teaching mean doesn't fit for the higher vocational students, the teaching effect is not ideal [1-5]. Therefore, explore a teaching method for higher vocational education is an important responsibility.

In 2006, the ministry of education issued a document, which was about improve the teaching quality of higher vocational education opinions, it clearly put the "work-integrated learning" as the objective for talent training mode in the higher vocational education. The guidance document pointed out the direction for

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teaching mode for reform in higher vocational education. According to the characteristics of curriculum for mould professional, taking the course of "punching process and mould designing" for "work-integrated learning" course which was explored the mould talents training mode.

2 Teaching Implementation of "Work-Integrated Learning" for the Course

2.1 Building Practice Base

The selected enterprises which were large scale, strong, and closely related with the mould professional, contacted actively, discussed cooperation plan [6-9]. Due to the course content was mainly involved punching metal sheet, finally, the auto parts company was reached the school-enterprise cooperation agreement. According to the agreement, the plan of "punching process and mould designing" course was 4 weeks; curriculum teaching and on-site guidance were made by technicians who have rich practical experience and expertise. The professional teacher was responsible for the management of students, and the students must work as the workers on time.

2.2 Formulating a Detailed, Feasible Teaching Scheme for "Work-Integrated Learning"

According to the product and equipment conditions of the enterprise, the teachers have to formulate the teaching scheme for "work-integrated learning" [10-15]. It was divided into two parts: firstly, students went the workshop to work together with workers, understood the automotive components production methods and mould processing method which were guided by workers. Secondly, the engineers taught the theory knowledge combined the processing parts.

2.3 Establishing a Reasonable Curriculum Evaluation System

The evaluation system focuses on process evaluation; including students' work attitude, labor discipline, and safety consciousness to examination scope [15-18]. Selecting a representative and comprehensive machining part as examination, through the mould designing and manufacturing, the ability of student about mould structure, mould assembly, and parts shape, size, precision, and technological process could be reflected completely. The final score composed for usually results of 20%(including grades at ordinary times, work attitude, safety checking), mould structure designing of 40%, and preparing for various parts processing route as 40%.

3 Achievements for "Work-Integrated Learning"

3.1 Effect on Course Teaching Has Been Greatly Increased

Due to the situation teaching in enterprise, it has targeted and intuitive features, specially fit for the higher vocational students' thinking characteristics. Students understand and grasp the knowledge easily, and the learning enthusiasm and initiative had been got to mobilize, study interest get motivated. For example: the knowledge of mould structure in the course of "punching process and mould designing" was difficulty for students as before, even though the teacher used the multimedia courseware and the animation to assist teaching, as a result, the student also could not understand and grasp the structure of every mould part, let alone the mould designing and part manufacturing. Since the situation teaching to the vehicle parts deep drawing mode for example, students could also do-it-themselves disassembling mould, and then the mould parts shape, size, structure, and forming methods in the teaching of problems can be solved. It is easy to understand and master the knowledge which was the difficult point on the theory teaching. After the end of the learning experience symposium, most of the students thought that the "work-integrated learning" method held in the enterprise was very good, it connected the knowledge of "punching process and mould designing" course with the practical mould designing and manufacturing, for the students, not only understanding and grasping easily, but also having a sense of accomplishment, and the learning interests and learning enthusiasm were driven up.

3.2 Students' Vocational Accomplishment Have Been Cultivated

It was especially favorable to cultivate professional ethics, safe production consciousness, labor discipline, and living habit for students on the situation teaching in enterprise field, which was the theory teaching or school practice teaching that cannot be compared. Students went to work with enterprise worker on time every day and discussed the problems about production, technology, enterprise production organization, quality and safety with production workers and technicians in the real commutes. As a result, the teaching model of "work-integrated learning" accelerated the transformation of students to the enterprise people. Students have gotten the professional knowledge in the meanwhile, the vocational accomplishment also have been gradually cultivated.

3.3 The Team for "Dual-Qualification Teacher" Has Been Constructed Greatly

With the further development of the education career, "dual- qualification teacher" is a kind of new ideal teacher type in the vocational education. He has solid theoretical foundation and most scientific knowledge at the same time, and not only obtains a corresponding qualification of teachers, but also has rich certificate of practical experience and strong post skills. He is a comprehensive teacher, who is

collecting ordinary teachers' quality and various technician qualities, both a knowledge disseminator and a practical skill demonstrator in the higher vocational colleges. It has a great significance to strengthen the construction of teachers' team and plays an important role to cultivate the mould talent education.

4 The Problems and Suggestions for "Work-Integrated Learning"

4.1 Higher Teaching Cost

When the students taught by "Work-integrated learning" went to enterprise, enterprise should send personnel to have a class and on-site guidance, security management and so on. It will affect their production, so with the process of "work-integrated learning", the enterprises must charge some practice expenses. In addition, at present, a lot of enterprises are unable to provide accommodation for student at present; the students have to take bus to school and enterprise in turn everyday and can not pay the highly cost, and the teachers who appointed by school to teach students in the enterprise class or manage students spend higher too. These fees lead to increase the difficulty of management, the school management must be consistent with the modern enterprise management. If there are some different opinions between the school and enterprise, they should reach a consensus on this matter as soon as possible, otherwise, it will affect plan implementation to the mode of "work-integrated learning". Now, there is a best way to introduce some strength enterprises into the school as training base to reduce the situation teaching cost in this circumstance. School must give these enterprises some certain preferential policies and construct the school practice base same as the productive practice base according to operation mode of enterprise. So it is very convenient to develop situation teaching in the school. Enterprises and schools are realized the win-win, at the same time, guarantee the stability of proactive practice base and situation teaching in the permanence.

4.2 Inadequate Operating Opportunity to Students

More chance of operation improved the ability of practicing and operation and helped them form a serious scientific attitude and deep thinking quality, but the equipment quantity is limited in the enterprise, and some machine tool equipments especially some precious and precise equipment are operated by the workers who trained and obtained the operation certificate. Considering the safety of equipment and personal, the enterprises regulate that if the intern students can not trained systematically they can not operate the equipment independently, and just to see and do some assistance works beside the main operator. But the course of "punching process and mould designing" is focus on the mould designing and manufacturing, the purpose of practice is to test the correctness of the designed and manufactured mould. If the students are short of operating opportunity, the effect of the talents mode of "work-integrated learning" will not embody to them.

4.3 Conflicting with Other Courses on This Term

In generally, the practice time for "work-integrated learning" must concentrate on 3~4 weeks, it will conflict with other courses on this term. So if the "work-integrated learning" carries out successfully in the enterprise for situation teaching, the school teacher must put other teaching courses on this semester for modular according to the time sequence in advance, which avoiding the conflicting among them but appearing a new phenomenon that students will have the same course all day for several weeks, some people are fatigued the same class and other courses some people are tired or bored of without situation teaching. The solution is that professional teachers select the courses suitable for the mode of "work-integrated learning", and focus on a semester of alternating for several classes, then the conflict will be overcame.

5 Conclusions

The problem of constructing an optimization practice teaching system for mould professional in higher vocational colleges is still important and urgent on the current practices. Through the years of teaching modes are explored, we found that the talent cultivation mode of "work-integrated learning" is a suitable and effective talents training mode among the present education. It has been shown that the mould professional students' professional skills and comprehensive quality is obvious superior than other training modes on the work.

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Feasibility Study on the Talent Cultivation Mode of "Work-Integrated Learning"

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Abstract. The feasibility study on the talent cultivation mode of "work-integrated learning" is discussed on the present situation of higher vocational education in this paper. It was analyzed with great significance such as promoting learning for students, promoting teaching for teachers, and promoting construction for school, promoting development for education by the work. Not only making full use of enterprise's superior resource, but also avoiding the waste of materials and saving the school equipment funds. The students' practical contents connect directly with modern production. Their professional skills and comprehensive quality are improved greatly. The results show that it is a suitable and effective talents training mode and also a typical "win-win" situation on the development between higher vocational school and enterprise.

Keywords: Feasibility Study, Work-Integrated Learning, Higher Vocational Education.

1 Introduction

"Work-integrated learning" is a new training mode, which regards the students as the main body and their employments as the guidance, and also is an organic combination based on the external environment and internal resources to achieve work and study fully and efficiently. It is so as to gain work experience and improve students' comprehensive quality and all aspects of all kinds of skills. The talent training mode accords with demands of the national for high-quality practical talents on the vigorously promoting industrialization [1-3]. So we must build a socialist educational system with distinct Chinese characteristics which is oriented to the 21st century and to meet the needs of socialist modernization.

The talent cultivation mode of "work-integrated learning" has outstanding achievements in foreign countries. Such as "Dual System" vocational education in German, " Sandwich" vocational education in England, " Cooperative education" between the United States and Canada, " Production and Study Combination" vocational education in Japan, and "Technical and Further Education" mode in

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Australia, which have been studied from two aspects of theory and practice on "work-integrated learning" [4-10]. But this mode started late in our country, cooperation education concept was introduced into China in the late 1980s, and then many schools made some exploration between the theory and practice of the education. With the development of education, the talent cultivation mode of "work-integrated learning" was researched continuously. Various education modes such as cooperative innovation of "Industry-University-Research Institute", "part-time" education, "work-study" alternate education, and "the ordered" education have been formed in our country [11-12].

2 Meaning for the Talent Cultivation Mode of "Work-Integrated Learning"

The higher vocational education is an education type in the higher education with Chinese characteristics. At the present, our country has entered the middle of industrialization. Because of Chinese huge market potential and rich labor resources, the world's manufacturing is transferred to China. China has become the world's manufacturing power. Therefore, we must take a new road of industrialization; the adjustment of industry structure and the transformation of an economical growth model urgently need to make the grand scale technology and technical personnel. But the reality is the especially serious shortage of skilled talents between production and service in the forefront job, and the "mechanic-shortage" restricted the rapid development of our country economic construction. The colleges as the main base of talent training have to develop a theoretical and practical experience rich applied talents is an imminent thing of importance. Therefore, the talent cultivation mode of "work-integrated learning" was born with great significance in universities education as following.

2.1 Promote Learning by "Work"

Some difficult or abstract contents which were taught in theory teaching to higher vocational students could be constructed in practice through situational image in order to understand clearly the relationship between the principle and application, it is also easier to discover, analysis and solve the problems, and then cultivate students' innovative consciousness and innovative abilities. The student taught by "Work-integrated learning" has learned a lot of good qualities from workers in the enterprise after several months of production practice, and their confusion on productive labor and professional learning were gradually transformed to desire or adequate. Most of them persist in setting strict demands on themselves, and from then on, it is nearly no latecomer or absentee again. For many of students in the school, that would be the most difficult thing to do. After going practice further in the workshop, the challenge they partly chastened makes them with an obvious progress both in mental outlooks and behaviors, integrated quality had been gotten an obvious improvement. Students of the talent cultivation mode of "work-integrated learning" are more self-confident and with richer professional knowledge skills than which are

taught in the school all the time. Finally, giving them more offers than others shortly after the induction in a competition on graduating from school. It was recognized that the talent cultivation mode of "work-integrated learning" is a suitable and effective talents training mode for higher vocational education.

2.2 Promote Teaching by "Work"

As the process of "work-integrated learning", teachers can communicate and exchange the experience about course teaching with the engineers in the enterprise, obtain timely a variety of new information such as which aspects knowledge enterprise need students to master, and which kind of technology has a great foreground, and so on. Then, the teachers would arrange the corresponding teaching courses more targeted to organize teaching and to formulate rational teaching plan and program, undertake to the student directional cultivating. Finally, the teachers' teaching ability has been developed comprehensively, and the teaching effect is improved greatly. On the other hand, due to the shortage of fund, the college is restricted to buy new equipments to supply the education resources. With the "work-integrated learning" platform, professional teachers can go to enterprise with students to contact the advanced equipments and advanced technology, through the study with teacher's business level also has been greatly improved. In the later teaching, they can prompt intellectual frontiers message to students, develop student's field of vision for training students' divergent thinking has good effect. At present, some universities formulate preferential policies to encourage young teachers to go to work in enterprise for half a year, which is to cultivate the teachers' practice ability, so as to improve the teaching level.

2.3 Promote Construction by "Work"

The students taught by "work-integrated learning" go to attend production practice or "Work-Placements", which leads to increase the difficulty of management due to scattering relatively. Because teaching course and practice course are taught at the same time in the enterprise, the school management mode must be consistent with the modern enterprise management. If there are some different opinions between the school and enterprise, they should reach a consensus on this matter as soon as possible, otherwise, it will affect plan implementation to the mode of "work-integrated learning". For example, a lot of enterprises are unable to provide accommodation for student at present; the students have to take bus to school and enterprise in turn everyday and can not pay the highly cost, and the teachers who appointed by school to teach students in the enterprise class or manage students spend higher too. So even in improving students' quality in the future under the premise of teaching, such as reducing the cost to negotiate with the enterprise, strive for enterprises to participate in more technical personnel to in the course of teaching, which can reduce the cost and improve the quality of teaching.

In addition, when students break away from the university campus life, they will appear many problems. For example, psychological problem, safety management, self-orientation, examination means and regulatory, and so on. A part of

vocational students could not have a correct understanding and proper positioning; they may be in unstable state of mind for a period of time and can not face their reality, expecting too far, the ideal and reality would start to question the significance of the university. At this moment, teachers must help and guide timely these students to build up the correct concept of employment and labor concept. But in our country, the working conditions and remuneration for a worker in the enterprise do not have obvious advantages to develop applied talents. So if we want to solve these problems, only in the practice of "work-integrated learning", gradually explore a better education mode to promote the construction of higher vocational colleges.

2.4 Promote Development by "Work"

Meanwhile, it should strengthen the building of the full-time teachers of its own and students' practical and training base, for ensuring the implementation of the strategy goal. But the investment for practice base construction is higher. It is difficult to meet the development needs if relying solely on the government or the school. At the present, most of colleges depend on enterprise and other social resources to strengthen construction practical and training base. Through the talent cultivation mode of "work-integrated learning", the enterprise can obtain a relatively short period of skilled professionals. Two modes of traditional mentorship and directly recruit graduates from campus are difficult to satisfy the demand of enterprise for technical talents. But among the school-enterprise cooperation pattern, the enterprise can take correct modes according their need to obtain the high-skill talents, such as "ordered" education, "concentration training" or "entrust grooms" education. Through the education, the staff quality is improved for the enterprise, at the same time, the operation cost is reduced and the economic benefit is improved greatly. On the one hand, the higher vocational school establishes a training base in enterprises, students will go to the enterprises to participate for "work-placements", firstly reduce the personnel costs for the enterprise. Secondly, the enterprise relies on the school resources to train employee, skills upgrading, and technical achievement transfer and all that will greatly reduce the cost. Thus, the talent cultivation mode of "work-integrated learning" is benefit for the school and enterprise.

3 Conclusions

The talent cultivation mode of "work-integrated learning" is a suitable and effective talents training mode among the present education. Not only making full use of enterprise's superior resource, but also avoiding the waste of materials and saving the school equipment funds. The students' practical contents connect directly with modern production. Their professional skills and comprehensive quality are improved greatly which have the obvious superiority than other training modes in the job market. Thus, the talent cultivation mode of "work-integrated learning" is a typical "win-win" situation on the development between higher vocational school and enterprise.

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Risk Measurement of Rail Transit Investment and Financing

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Abstract. Rail transit infrastructure construction is the major power to improve the economic development, and the transit is the focal point of the infrastructure construction, which is an important way to solve the public traffic problem in big cities. Under deeping the reform of Investment and financing background, from economic attributes and characteristics of the rail Transit investment and financing, we analyze the factors of rail transit investment and financing system. Now, rail transit has a very special opportunity to expand it's scale. Investment and financing have much characteristics as more participates, complex structure, much risk factor, cte. Therefore, it seems particularly important to strengthen the risk management of the project financing. Based on future earnings, transport economics, financing costs minimized and the internalization of external benefits of innovation, this paper uses hierarchy analysis method that measures investment and financing risk of railway transit and identifies the key factors in its influence.

Keywords: AHP, Railway Transit, Investment and Financing, Risk measurement.

1 Introduction

Carrying out investment projects related to decision-making and analysis, people are often faced with the uncertainty of future benefits in the project. It may be the political, cultural, social factors, economic environment, resources, market conditions, technological developments and other factors. This uncertainty factors about the future decision-making process constitutes the project's risks.

In order to improve decision-making more scientific and more effective risk management, we need to research the uncertainty and risk problems. So people have proposed all kinds of uncertainties analysis method, this method are widely used in investment feasibilitiable projects studies or project evaluation process. Such as break even analysis, sensitivity analysis, probability analysis, risk decision-making and so on. This mehods majorly study investment projects that will directly affect economic factors, such as product sales, selling prices, operating costs, project life cycle, construction, investment, etc., this paper called "intermediate variables"[1].

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Based on the background, this paper tries to propose a new framework for uncertainty analysis; this analysis will examine the basis points from the price, sales, investment and other intermediate variables to their underlying causes of the more fundamental risk. So that we can depth understand investment risk and Propose more targeted measures for the risk management from the risk source.

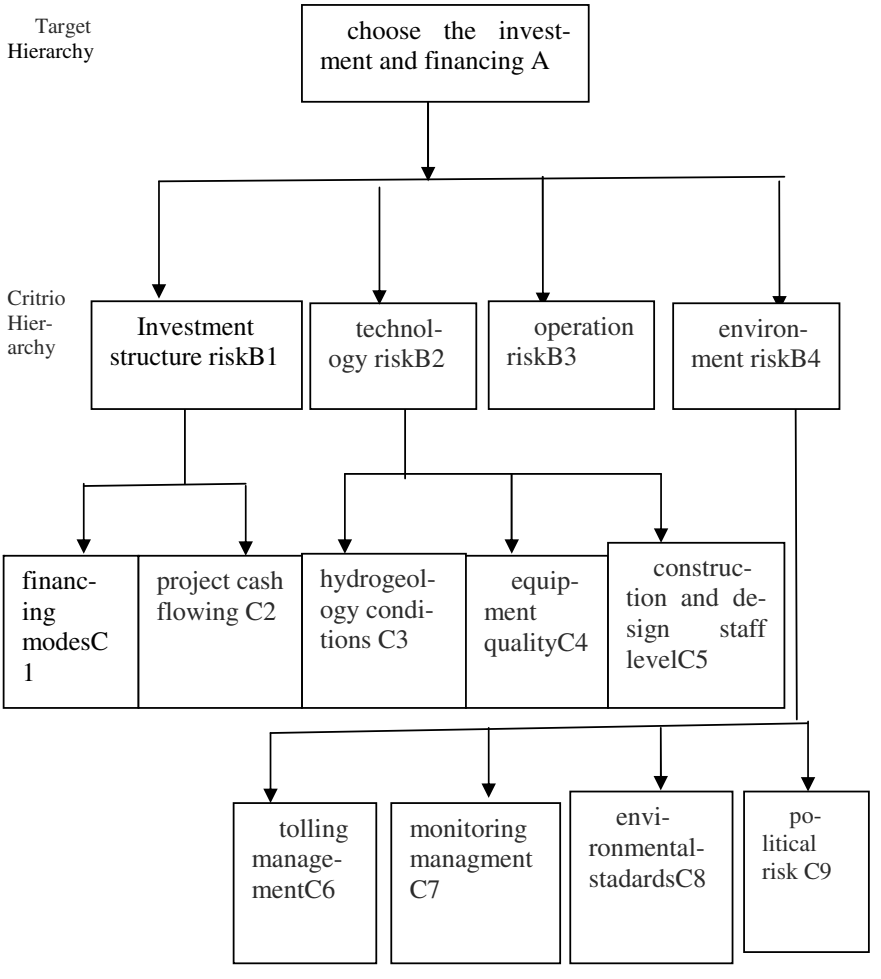

Fig. 1. Rail transit investment risk factors of hierarchical model

2 Rail Transit Investment and Financing Management

Rail transit infrastructure is an important condition for the survival and development of one large urban, it improves the efficiency of the residents and the importance of promoting economic development in the city commute way. This paper

will analyze the definition of railway l transit, their own characteristics and its economic development in the city[2].

Rail transit is located within the city driven by electric power, it belongs to rail public transport system, and it's frequent independent of other transportation system projects, it has energy-saving, space-saving, fast, large volume, all-weather, non-polluting (or less pollution) and safety features, a green transportation system, in line with the principles of sustainable development, especially suitable for large and medium cities.

3 Rail Transit Investment Risk Measurement Model Constructed

3.1 Judgment Matrix

Table 1. Judgment scale

Important degree	definition	Words description
1	Equal important	Two elements of the same functions
3	slight important	An element is slight important than another element
5	important	An element is obvious important than another element
7	Very important	An element is tremendous important than another element
9	Absolute strong	An element is Absolute important than another element
2,4,6,8,	Intermediate value	

3.2 Construct First Level Judgment Matrix, Determine the Single Ordering and Weight

Table 2. The first level of judgment matrix

A	B1	B2	B3	B4
B1	1	3	5	7
B2	1/3	1	3	4
B3	1/5	1/3	1	2
B4	1/7	1/4	1/3	1

The results of hierarchy bill ranking:
W1= 0.5731 w2=0.2532 w3=0.1082 w4=0.0655
λmax=4.0583 CI=0.0194 RI=0.9 CR=0.0216<0.1
Consistency checking: consistency.

3.3 Construct the Second Level Judgment Matrix, and Determine the Weight and Consistency Checking

Table 3. The second level judgment matrix(B1-C)

B1	C1	C2
C1	1	2
C2	1/2	1

The results of hierarchy bill ranking:
W1=0.6667 W2=0.3333λmax= 2 CI=0 RI=0.000001 CR=0<0.1
Consistency checking: consistency.

Table 4. The second level judgment matrix(B2-C)

B2	C3	C4	C5
C3	1	2	3
C4	1/2	1	2
C5	1/3	1/2	1

The results of hierarchy bill ranking:
W1=0.5396 W2=0.2970 W3=0.1634
λmax=3.0092 CI=0.0046 RI=0.58 CR=0.0079<0,1
Consistency checking: consistency.

Table 5. The second level judgment matrix(B3-C)

B3	C6	C7
C6	1	3
C7	1/3	1

The results of hierarchy bill ranking:
W1=0.75 W2=0.25
λmax=2 CI=0 RI=0.000001 CR=0<0.1
Consistency checking: consistency.

Table 6. The second level judgment matrix(B4-C)

B4	C8	C9
C8	1	4
C9	1/4	1

The results of hierarchy bill ranking:
W1=0.8 W2=0.2
λmax=2 CI=0 RI=0.000001 CR=0<0.1
Consistency checking: consistency.

3.4 Construct the General Hierarchy Ranking and Determine the Weight and Consistency Checking

Table 7. General hierarchy ranking

hierarchy C	hierarchy B				general hierarchy(C) ranking
	B1 0.5731	B2 0.2532	B3 0.1082	B4 0.0655	
C1	0.6667				0.3821
C2	0.3333				0.1910
C3		0.5396			0.1366
C4		0.2970			0.0752
C5		0.1634			0.0414
C6			0.75		0.0812
C7			0.25		0.0271
C8				0.8	0.0524
C9				0.2	0.0130

C1>C2>C3>C6>C8>C4>C5>C7>C9.

According to the risk analysis and evaluation of various risk factors, the paper gets the weights of the sort risk factors. The most important factor is financing way, next is project cash flow when we select project investment, these conclusions can be used as an important basis for risk management.

4 Conclusion

AHP theory is comprehensible and convenient in project. Especially it is suitable for use among parters, because the organization of the parties cooperated-boiling in China at present is matrix modes, so the levels of managers can use AHP to analyze the risk of partial project in major risk, and provide the prerequisite. for the whole project about risk identification, analysis, evaluation.

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Cultivating Innovative Applied Talents by Constructing the Specialized Core Curriculum System

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Abstract. A mentality of cultivating innovative applied talents by means of constructing the specialized core curriculum system is proposed. Take the Computer Aided Design course of computer engineering institute college for example, the course status and problems existed on the teaching process in domestic universities are analyzed, and four-dimensional teaching system model of the Computer Aided Design course is proposed to develop the innovative talents and engineering practice ability. The practiced result more than three years shows that it can effectively improve engineering practice ability and innovative design capabilities of students.

Keywords: Innovative Applied Talents, Computer Aided Design, Course System, Four-dimensional Integrated.

1 Introduction

Training applied high-quality personnel that have innovative spirit and creative ability is the core problem of concept of talent and quality in general engineering colleges in the 21st century, it is also the key of building an innovative country [1]. The specification come from Ministry of Education, the content of teaching programs and curriculum reform plan in Higher Engineering Education for the 21st century, had indicated that, the purpose of higher education is higher education's course content, the curriculum system and the teaching method closes or achieves the world advanced level, and student's knowledge structure can meet the needs of socialist market economy and new scientific technology, especially the project practical ability and innovation ability has a big enhancement. Because of the importance of innovated ability cultivation, some experts and scholars had made a large number of researches on the aspect such as training mode of innovated talents, creative ability, engineering practice etc. Moreover, students of different majors' college project application ability and innovation ability's raising

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plan had been explored and implemented [2]. But raise the student project ability and innovation practical ability by means of revolving specialized core curriculum aspect elaboration had a rarely report. Professional core courses can be determined by each university according to professional characteristic and the university characteristic. In this paper, on the basis of the teaching practice of computer-aided design (CAD) in computer department, a teaching model of four-dimensional integration of engineering application and creative ability training is proposed, this research give a way to the training of innovative applied talents.

2 Current Teaching Status of Computer-Oriented CAD Course

CAD program itself is an interdisciplinary; it is the product of combination of traditional professional of engineering and modern computer technology. The basic goal of computer-aided design course is to make students master the ability of using CAD software to complete the professional design modeling and engineering drawing, take advantage of CAD software to help to complete professional related design and innovation [3].

Ten years ago, CAD course has been created in Machinery, construction and other engineering specialties in higher institutions. But it is only in the recent years that computer department start to create CAD course. Some higher colleagues have not set up the course until now. This situation can not meet manufacturing industry information strategic thinking of our country, does not reflect the important role of computer in the field of engineering design.

There are some problems in the process of teaching of CAD course of computer as follows [4]:

- Course content is single, Course coverage is narrow and lack of relevance. Most schools mainly teach the function of AutoCAD software, some teach the Protel software function, some institutions do not yet set up the course, Very few institutions mainly teach about three-dimensional computer-aided design.
- Course hours is less and course target is low or delayed. The total course hours is usually 36 hours in the majority, there are also 32 hours, or even 24 hours, use of software basically rely on the self-learning of students, After the courses, the ability of CAD software design of students is generally poor , it can not achieve the level of enterprise applications.
- Teachers is seriously lagging behind and lack of dual-qualified teachers that has both a rich engineering practice, innovation, and certain theoretical level. It is not conducive to training of creative ability and overall ability of students.
- In implementation of course, Lack of specific measures and systems security that can improve the engineering practice and innovation ability.

The main reasons that cause this situation are: College has insufficient understanding of the cultivation role that courses have in the engineering practice and creative ability of students; as to how to set up CAD programs in computer professional, there is no uniform national guidance documents and curriculum planning yet. In recent years, with the promotion of national engineering and manufacturing

information, advanced CAD technology has been widely used in the relevant industries and enterprises. Application scope and application depth of CAD software are increasing continuously, the situation that students only learn the basic principles and functions of CAD software can not meet to the needs of enterprise development.

3 Four-Dimensional Integrated CAD Teaching System Aimed to Train of Engineering Practice and Innovation Ability

For the above problems, we believe that CAD course should clarify the basic concept and design ideas of CAD, let students master a kind of CAD software and gain a ability of innovative design based on CAD software. We are in the revised syllabus, we made a new plan to teaching practice content and specific measures of CAD course by sending key teachers to participant in software course training and invite enterprise engineer to train for teachers and students. In this way, several teachers that have both Solid theoretical foundation and rich experience have been trained successfully. Thus, teacher problems in the process of teaching and practice are solved [5]. As to the problems that curricular hours is lack and Employment Of students in computer is not well, We integrated course study, extracurricular training, accreditation and innovative design competitions closely, Created a four-dimensional integrated CAD course teaching system in Compute department. The teaching system is based on course theory teaching, it melt into the software training, engineering practice, accreditation, and innovative practice, this exploratory studies to teaching of CAD course have a significant effect.

Specific ways are as follows: plan course time is 48 hours, where, theory teaching takes 32 hours (including software function teaching), practice parts take 16 hours, and course design link is increased. In the second semester of junior year, set up the course in the first half semester, and software training is in the latter half of the semester, from senior year, complete course design within one month. In the following, do certification exam, and participate in the National Innovation Design Contest, it need about nearly a year to complete with the software training, accreditation and innovation design competition Overall, it is shown in Fig.1.

Course Learning Link. This link mainly includes course lectures and experiment on the computer; it is a basic link that train innovative application ability. The lecture contents mainly include the basic theory, basic concepts, with specific software, make it clear of basic process and design ideas of engineering design. According to syllabus, CAD course has 48 hours, in which, 16 hours is spent on experiment on the computer. Content taught in class mainly include sketching techniques, parametric design, module design, feature modeling, assembly modeling, product data management, computer-aided engineering analysis, curve and surface modeling techniques, it covers the basic module functions of CAD software. According to the basic theory and the corresponding case taught in class, in the experimental part, complete experiment of typical cases on computer and master the basic functions of the specified software.

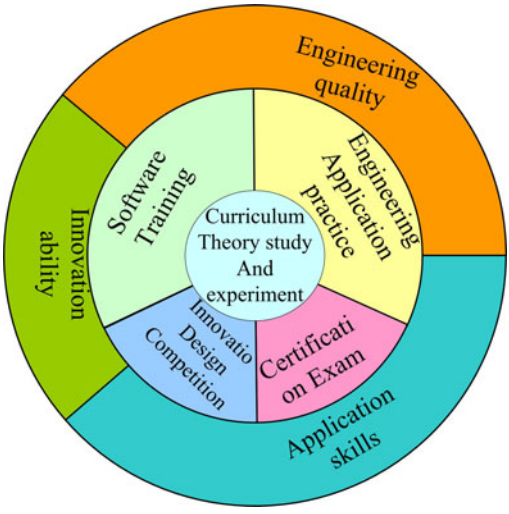

Fig. 1. Four-dimensional CAD Teaching and Practice System

Software Application Practice. This link mainly does software application training, mainly uses free time of students, and arranges 4-6 hours per week in general, ten weeks in total. Training content is Consistent with the training of Software certified engineers, Training cases are mainly from typical cases of engineering, Original certification training pay more attention to mastery degree and software application ability of students, it is in line with international standards. Let students master the main function of the software by means of case teaching, qualified teachers or enterprise applications engineer are instructors. Each student has a computer, LAN video interactively, students practice the cases after teaching, instructors solve students' problems on the spot, and this method greatly stimulated the enthusiasm of the students. Students through training can obtain skilled engineers certificate, and recommended to participate in the original engineer certification exam.

Engineering Practice. This link mainly train students' ability of engineering awareness, collaboration and preliminary innovation. in this link , 3-5 students is a design team, Cooperate to complete a moderately complex assembly design, Submit digital model, engineering drawings and assembly and parts simulation, design brochures and other results of materials. This link can be arranged in the junior summer vacation and senior. This link adopts group teaching model, Assembly models come from industrial design products of summer practice units or something students are interested in. such as toy models, automobile parts, hair dryer, games, character modeling, soybean milk machine, electric fans, etc. Through this link, students can really be familiar with the specific product development process, and exercise teamwork ability. Meantime, the ability of innovative applications design is exercised, outstanding works that design team submitted through further revised can be recommended to participate in modeling competition.

Assessment Certification. After system study and practice, Recommend students to participate in the original engineer certification examinations or other approved employer certification exam. Original certification exam is generally more difficult, and the charge is higher. Before Formal examinations, organize an online mock exam so as to improve the pass rate.

Organize Students to Participant in the National Design Competition. The national innovative competition design now are mainly as follows: "Challenge Cup" National University Science and Technology Works competition, Three-dimensional modeling and Digital Innovation Design Competition organized by National Manufacturing Training Center, Product Innovation Design Competition in China, nationwide innovative design contest organized by some software manufacturer, etc. through Involving in innovative design contest, students can further improve the overall quality and innovation ability, and lay a good foundation for employment.

4 Practice Results

In two years, more than 600 computer science' students have participate in my university' course reform practice, there are 256 students that gained a certified qualification, there are 18 people that receive awards in a national design competition, 8 employers request for computer science' students to engaged in design work to their units. in the teaching evaluation process organized each year in my university, teachers that teach this course have received good evaluation for two consecutive years; More than 20 certified university students participated in the scientific training program and had received outstanding achievement awards.

Practical results show that: In the teaching practice of computer professional CAD course, four-dimensional integrated can effectively improve engineering quality and software applications skills of the students, and train innovative thinking and innovation ability of students.

5 Conclusion

To train application-oriented talents that have innovative ability is the goal of higher engineering colleges. in the training process of Creative Application talents of computer, Around the core professional curriculum planning and teaching system, Implementation reforms of course teaching system in teaching, training, engineering practice and curriculum design, certification and competition and other aspects of the curriculum could improve the engineering practice ability and innovative design capabilities of students, training of innovative applications talents of other professional can also reference to it.

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Research of Education about Industrial Design Based on the Modern Engineering Design Software

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Abstract. Based on the analysis of current situation in industrial design education, the idea of concurrent engineering education was taken into modern industrial design education. The design software made for the platform, the capability of modeling the product shape, designing the structure of the product, concurrent designing, product performance and product manufacturing was made for the goal of modern industrial design education. At the same time, the process of product research and development made for the main line, modern industrial design education teaching modules taken for the content of research and exploration, the reform and exploration of industrial design education was carried out. On the basis of this, a three-dimensional teaching system was established. The teaching system was creative exploration in the improvement of the quality of students abality establishing in effect, especially under the backgroud of insufficient resources of teaching equipment and facilities and higher education popularized.

Keywords: Engineering software for design, Three-dimensional teaching system, Industrial design education.

1 Introduction

As the 21st century, with the rapid development of computer technology humanity has entered a new era of information explosion. As the combo outcome of technology and culture, Industrial design will be subject to the impact and the challenges of technological development. It requires a positive attitude to take the current social value of the non-material, software, value of non-visibility into the design field[1]. Therefore, in addition to shape of production, the specific content of industrial design education should also include technology, function, configuration, and the design changes of the times required for cultivation, which was from realization of the humanities and social sciences, top science, technical, historical, social, cultural and environmental, and understanding of the design established the correct values and ethics[2-3]. At the same time, the direction of industrial design

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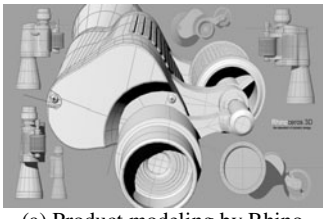
education should shift from the traditional model to one, which was centered on experiment, research and development, and measured by design communication and design practice, and strengthen by the feedback and evaluation on the design, and to accelerate the level of the final design for the entire student position upgrade[4]. By the way, students can have a keen insight, innovative ability and the ability to solve practical problems, and closely integrate the latest scientific and artistic ideas, and use new materials, new technology and new technology achievements market dynamics for innovative design, and become a qualified industrial designer, and finally meet the social, business, consumers and other design professionals need.

Of course, in the background of higher education popularized, design education imperfect, the equipment lack, it was important and urgent that how to train design students to become qualified industrial designers with the ability. So this paper try to use the design software resolve the above question.

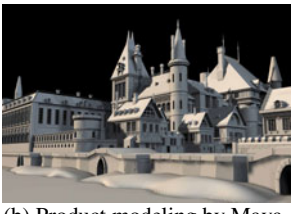
2 Role of Modern Design Software in Students' Capacity-Building for Industrial Design

2.1 Capacity-Building of Product Modeling

Product modeling design was targeted to industrial products as objects, in accordance with certain aesthetic rules, under the premise of ensuring the use of the product features, the beauty of the texture of was shown by the new materials, the value of the advanced processing technology means was reflected, the harmoniousness of the form factor of the overall was expressed, the beauty of innovative spirit and color was pursued. But in product design, it is difficult to articulate the detailed structure of the product by hand, especially involved in smooth surfaces not be expressed by two-dimensional drawings. Therefore, using modern design tools (for example, computer-aided design) is more intuitive, clearly to show the product appearance. If you want to reproduce the realistic style of ancient Greece or the cool post-industrial era of precision product curve, then the Rhino is the best option, shown in Fig.1(a). If you will show the romantic style of Rodin sculpture, or Dali-like deformation, Maya should be most selected, shown in Fig.1(b). In short, by the rational use of design software, the efficiency of product development can be greatly improved, design was made to be easier and more convenient expression, so modern design software was important and integrant to train a student studying industrial design capacity of product modeling.



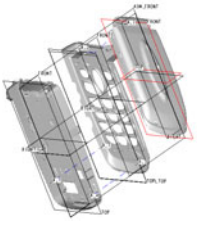
(a) Product modeling by Rhino



(b) Product modeling by Maya

Fig. 1. Schematic diagram of product modeling by modern design software

(a) Model established by Pro/E



(b) Model modified by Pro/E

Fig. 2. Parametric Modeling by Pro/E

2.2 Capacity-Building of Product Structure

Novel, fashionable appearance was the pursuit of industrial designers, and scientific, rigor structure was an important support to achieve this goal. But at present in product design, most of the designers was accustomed to innovating on the product shape, color, and often neglecting product structure, and even lack of awareness of the product structure, which ultimately caused that design will become "empty talk " because of designer lack of ability of designing structure. Therefore, the designer must understand the structure of the product and make full use of existing processing methods and structures in order to enhance the use of the product functions, improve work efficiency. Moreover, novel structures of products will give the consumer a strong visual impact with a new look, so as to arouse the desire of people to buy or use. But the student can be educated efficiently on the ability by the design software. Taking Pro/E for example, by the parametric design and feature-based solid modeling systems, firstly engineers can make several more complicated structure, as shown in Fig.2(a), secondly by changing the parameters of a smart features, the new model can be generated as the user need, as shown in Fig.2(b). So the design software made capacity-building of product structure more simple and flexible.

2.3 Capacity-Building of Concurrent Design

Concurrent Engineering is respond to the voice of low-carbon manufacturing. Concurrent Engineering is design model that in the product design phase a variety of key performance indicators was focuses on taking into account the product life

cycle (from concept to product recycling or scrap processing) in order to avoid unnecessary rework and repetitive work in later period. So in higher education, students must be gained this culture, but how to do? The most effective way was also by the design software. In traditional product design, product was carried out mainly in accordance with the ”Design-Manufacturing -Use -Change -Redesign” process. This process was lack of analysis and thus a lot of waste was created. But by design software in design process, low-carbon manufacturing was made into reality, as shown in Fig.3 concurrent engineering carried. In Fig.3, Pro/E and other three-dimensional software were made use of on the computer to complete the design, simulation, analysis and simulation experiments, and finally the efficiency of product design and development was greatly improved, and the design costs was reduced.

2.4 Capacity-Building of Expression Design

Good design need to be expressed and recognized smoothly with the consumers, which requires designers possess the sophisticated technology of expression design facing the abstract concept and idea, and they can turn what they thought about into photorealistic product that had specific shape, color, texture, light and atmosphere, causing people to feel sympathy, with a strong practical. The traditional means on expression of industrial designers to design was hand-painted renderings, as shown in Fig.4(a), but in recent years with the development of computer technology, computer renderings was more favored for designers because of much advantages, such as good effect, easy to design, change and save etc. For example, the effect of renderings rendered through appropriate material and lighting settings in the design software can be compared to actual product performance, so as to accurately reflect the designer's design concept, as shown in Fig.4(b) and (c). So through teaching in the design software, capacity-building of expression design of students will be improved more rapidly, at last design and expression was united together perfectly.

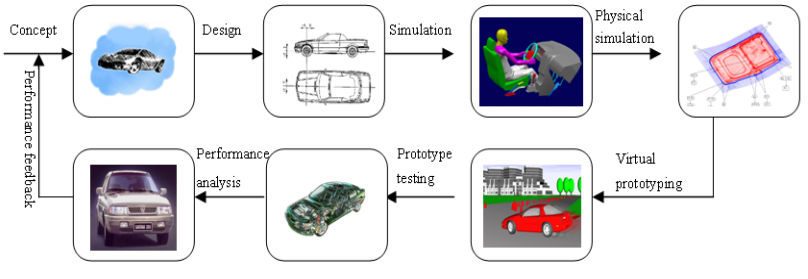
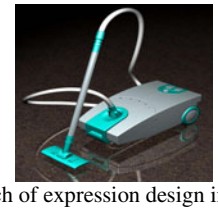


Fig. 3. Sketch of product concurrent design on the platform engineering software

(a)Sketch of hand-painted renderings

(b)Sketch of expression design in CorelDraw

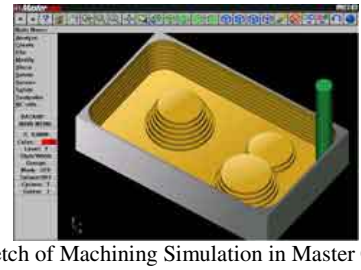


(c)Sketch of expression design in 3DMax

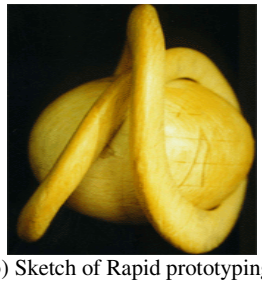
Fig. 4. Sketch of expression design

2.5 Capacity-Building of Product Manufacturing Process

Industrial design education must pay attention to product manufacturing process or the model making, so that students can experience the most intuitive form, materials and colors match. But due to resource constraints and equipment in the domestic colleges and universities, students cannot operate cutting machine, drilling machine, milling machine, CNC machine and other specialized equipment personally. Students are often very hasty for making model, even they consign those model to the production company for making[5-6]. In this context, we must rely on computer simulation platform for processing, so that they can master product manufacturing process. Currently in terms of capacity-building of product manufacturing process, there are two options, on the one hand, after three-dimensional modeling established, product manufacturing process was simulated on CAM software platform, such as MasterCAM, DelCAM, PowerMill, Cimatron etc. By this way, whether the model can be machinable will be tested, as shown in Fig.5(a). On the other hand, after three-dimensional modeling was conducted and simulated on slicing, it was tested in rapid prototyping machine, as shown in Fig.5(b).



(a) Sketch of Machining Simulation in Master CAM



(b) Sketch of Rapid prototyping

Fig. 5. Sketch of two product manufacturing process

3 Industrial Teaching System Reform Based on Engineering Design Software

Engineering design soft-ware enabled the designer express design idea comfortably. Before the product put into production, the broad range of issues can be analyzed directly and accurately by three-dimensional performance, virtual assembly, animation, simulation in engineering design software. At the same time, in teaching process, students can quickly find the different effect made by material, color and other design elements, do not need to wait until the manufactured.

The effect of teaching must be prodigious. So the effective industrial teaching system must be throughout engineering design software. For example, taking Pro/E for three-dimensional solid modeling, and then exporting the file formats such as IGES to 3DMAX or other 3D rendering software designed for rendering, finally decorating in Photoshop, the design will not only be in a realistic product renderings, but also be quick and Environmental.

Therefore, combined with practical experience in teaching and research a great deal of data from higher colleges of China and other country, product research and development for masterstroke, three-dimensional engineering software-based teaching system was brought forward. This teaching system get a better teaching results in enhancing the student's ability and improving the quality of education in reality.

4 Summary

To improve industrial design students' the ability such as product modeling, structure, expression, manufacturing and innovation, to address the existing problems of domestic design education, combined with the actual teaching situation of industrial design and requirements of employment, the three-dimensional teaching system based on modern engineering software was established. In this system product development was made for main line, and modern industrial design teaching modules was made for the main content. This system can educate student study independently and exploringly. Improving student ability was made for the goal of it. This system gave full play the advantages of the engineer software to work, focusing on theory and practice, explore the reasonable mode of education on the industrial design. As a word, this system has a certain practical value.

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Conceive and Construction of Engineering Training Model Based on the Concept of International CDIO Engineering Education

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Abstract. This paper has analyzed the current problems exist in high education training, conceives the implementing scheme of engineering training mode based on the concept of international CDIO engineering education to develop students with humanistic, innovative and engineering qualities. And provides detailed expatiate on the construction of a new mode of engineering education for talent training. With three items throughout the training system to develop a detailed program implementation and assessment methods, thus the paper builds a new and more detailed training model for engineering education. It turns out that this new training model is more suitable for students than traditional method on comprehensive capacity building, making engineering graduates more fitful for various work environments and the needs of complex society.

Keywords: CDIO, mode, talent training, construction.

1 Introduction

The task of high education is to culture the advanced specialized talents with innovative spirit and engineering practice abilities. So it is an important mission for high education, also the trends of higher education, to develop innovative education and training creative talents with engineering practical abilities[1]. Zhejiang University City College has established the industrial center with the support of Hangzhou government, in which provides practice conditions for undergraduates with their engineering quality and creative ability.

2 The Current Problems in Talent Training

(1) The concept of traditional education is old and the model is backward. Students' knowledge range is Narrow, and the content of course is behind the times, which reflecting the lack of discipline on the forefront of new subjects, new technologies and new thinking of knowledge.

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(2) The teaching methods are stiff and pay too much emphasis on examinations and results. This is lack of heuristic research-type atmosphere.

(3) More attention is placed on theory and calculation over practice and experiment, making theory apart from reality, which is not conducive for students to develop the abilities of identifying and solving problems.

(4) The lack of basic economic analysis and forecasting demands of market during engineering education making students weak in economy and efficiency consciousness.

Overall, enterprises believe that "team spirit, cooperation capacity " and "hands-on practical ability" are the greatest shortage of engineers and technicians. From an objective point of view, especially from innovation, those personnel are short of the spirit of entrepreneurship and innovation, also lacking of power on turning the inventions, patents and high-tech skills into products with market value promptly[2,3].

3 Overall Conceive

(1) Fully implement the international CDIO engineering education concept, which is taking mechanical design and mechanical manufacturing engineering as the led course, at the same time, making the engineering project throughout the subject system, thus, strengthening the theory and practice in curriculum integration.

(2) Through the study of engineering graphics, mechanical design of geometry precision, mechanical principle, mechanical design, mechanical manufacturing engineering, as long as professional comprehensive practical training, can develop all basic qualities and skills which are required during practical engineering.

(3) Through the implementation of the engineering project can enable students to master the operation process of heavy mechanical engineering, develop students with mechanical design capabilities, the ability of mechanical manufacturing, moreover, cultivate students to analyze and solve problems.

4 Concrete Methods

(1) Combine with engineering practice closely, deepen the reform of personnel training methods

From the very beginning of second semester of sophomore, students are required joining in the discussion and research related with engineering projects. By using the most basic and professional courses to support the implementation of projects, and open disciplinary seminars periodically about the major progress and engineering projects, also, arrange students into enterprises or institutions to get trained practically and do survey so as to get know how the major is going on in the whole world.

(2) Based on developing students' ability, founding HEI-CDIO Training Mode

Based on the concept of international engineering education CDIO, aiming at improving the overall quality of students from humanistic quality, engineering innovation and quality aspects.

" Humanistic Quality*" ability training* - through arranging elective courses of humanities and social sciences in teaching program, such as career planning and design, readings in extra-curricular one hundred and exchange book review to enhance emotional education and noble sentiment, develop students social responsibility and professional ethics, also establish lofty ideals and goals in life.

"Engineering Quality" ability training – with an engineering project being run through the curriculum, by studying mechanical design of geometry precision, mechanical principle, mechanical design, mechanical manufacturing engineering, fundamentals, as long as professional comprehensive practical training, can develop all basic qualities and skills which are required during practical engineering. When the implementation of the project completed, students are able to master the operation processes of mechanical engineering, design and manufacture machines, analyze and solve problems.

"Innovative Quality" ability training - by studying mechanical innovation can develop machine and artistic innovation, encourage students to perfect personality development, stimulate innovation and enthusiasm, develop students analyze and solving problem during the course of project implementation. All these help students with promoting their innovation quality.

(3) Using projects as a carrier, focus on students' basic quality and ability training

According to the previous three training mode, there are three item projects when carrying out the project, on which basic quality and ability is mainly based.

The first item: the humanistic subject project. It is combined with professional features to design the humanistic subject project. The key point is to study the relationship between engineering and social, as well as the effects engineering works on society. This helps students with social responsibility, to contact and know society as soon as possible through study projects and social research.

The secondary item: engineering design projects. It is mainly based on the CDIO philosophy of engineering education, combined with professional knowledge to establish engineering design projects though industrial research or teacher research projects by consultation with the instructor. and the project is carried out in the research mode.

The third items: graduation project. It is a comprehensive investigation of the study achievement of students in four years with wide coverage. And the subject of graduation design could be a continuation of the secondary item, and if the secondary item has been completed, the third project (the graduation project) can be set up based on that.

(4) Taking professional environment and laboratories as pivot to building a new practical teaching system.

This teaching system is based on the industrial centers, innovative practice and professional laboratories to create the workplace environment. During planning and construction of professional environment, with closely special attention to the curriculum system and teaching content. At the arrangement of experimental content and the choice of experimental methods, the model is trying to instead too much validation experiments with more designing, comprehensive, creative experiments, making an effort to break through the traditional experimental method which set up by courses.

(5) Practical implementation the problem-based teaching and open teaching methods, individualized curriculum, bring students into full play during teaching with independent, knowledge-seeking and creative abilities.

During practical training and experiments, the items are based on practical problems in engineering projects, mostly are comprehensive pilot projects, given full play of students to develop their independence, knowledge-seeking and creativity. Students are free to implement experimental items by using laboratory equipment. In practical training items, the students can also select training module by themselves or implement self-made items at the base using spare time, under the condition that they meet the required credits.

(6) By combination in-class time with space-time to develop the innovative spirit and engineering practice of students.

Theoretical course content should be closely integrated with the extra practice, using theory to guide engineering practice and innovative design. Extra-curricular engineering practice is set with credits and increased the proportion, so as to mobilize the initiative of students, which is a necessary complement in training students with the innovative spirit and practical ability. There are eight modules for extra practice credits, such as Numerical Control Programming and Processing Practice; Engineering Graphics strengthen Practice. The core of all these practices is to do innovative design and engineering training, aiming at helping students get training and practice from multi-channel, multi-faceted ways and improve their overall quality and ability of engineering practice to be a higher qualified engineer.

(7) Strengthen construct internal and external training bases to enhance awareness of students of engineering practice

In the new training program of electromechanical specialty, such concentrated practice, like metalworking, awareness training, social training and practice, etc, have been arranged

Metalworking is arranged at the short term in freshman year and lasts two weeks. The main purpose is to train students with practical ability and skills, while let students have a professional perceptions. This practice is primarily conducted in the Zijingang Campus of Zhejiang University.

Cognition practice takes a week at short term in sophomore. Its main purpose is to enable students to have an overall understanding of mechanical electronics specialty before learning specialized courses. The bases for this practice include Hangzhou Machine Tool Group, Hangzhou Automotive Engine Factory, Hangzhou Steam Turbine Co., Ltd. and so on.

Social practice and professional practice are arranged at the first semester in senior year, aiming at testing how students works in practices, at the same time combing practices with actual production to help students further understand and grasp all professional knowledge. This phase of the training and practice, primarily takes place at medium-sized enterprises in Hangzhou.

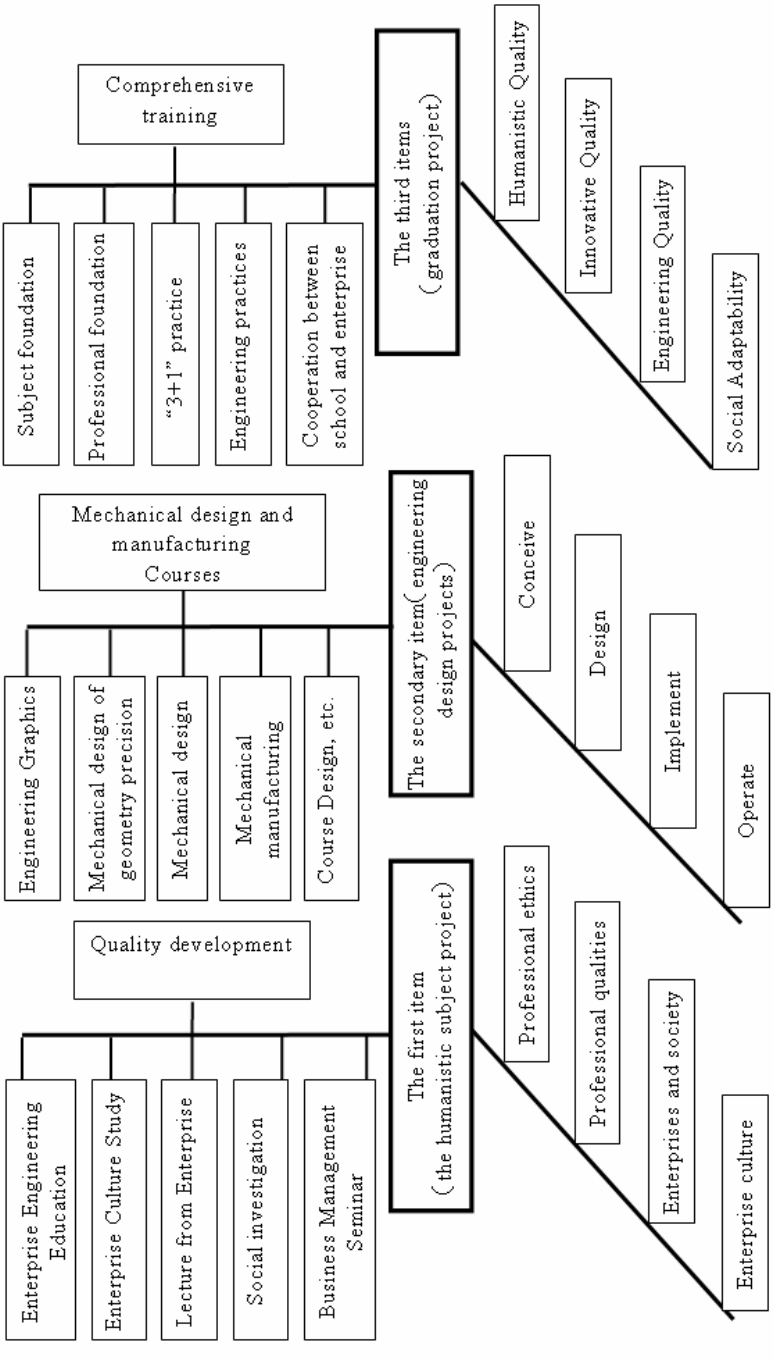

Fig. 1. Culture System Chart

5 Evaluation Mode and Requirements

In accordance with the training objectives and its requirements, the implementation of all items is based on teaching requirements through curricular and extra-curricular time. The three-class items works throughout mechanical design and manufacturing curricular system, and the evaluation mode has changes from other courses accordance with the requirements of the school. The evaluation is based on the three-class items; those projects involved with enterprises can carry out by consultation with mentors and human resources of that company to make specific implementation of the program for students. Students take practice in one company which is facilitative for business management.

6 Summary

Higher Education researchers must focus on training students with innovative spirit and practical ability from a strategic height, put innovative and engineering education on a prominent position. The teaching reform should always adhere to the student-centered, both in classroom and practice teaching, and always observe and analyze problem with perspective of the learner's growth process and environment. So, in order to cultivate students with a strong sense of innovation and high quality engineering, researchers should build a new educational environment and training model. In the process of realizing the training system, students are shaped with fine style that is to think modesty, to be honest, to set solid professional foundation, to work hard, thus, they will be professional pillars of our country in economic development.

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Adding Value: Strengthening the Relationship among "Teaching", "Learning" and "Researching" in Undergraduate Engineering Education

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Abstract. This paper focuses on the discussion of project-based pedagogies in undergraduates' engineering education *via* strengthening the relationship among teaching, learning and researching. The relationship among "Teaching", "Learning" and "Researching" has been described as a triangular-interwork, in which the important roles of the undergraduates have been stated. Some practices and suggestions for redesigning some engineering classes and programs to include more student engagement have been given. Successful examples carried out in three levels, *i.e.,* course-level, major-level, and industry-level, in Ningbo Institute of Technology, Zhejiang University, have been presented in detail. They are based on the key line of major related industry, whilst the project-based learning is persistent in the whole engineering education process. This paper also lays out the possible routes for achievement of good relationship among teaching, learning and researching, by both teachers' and students' sides, aiming at enhancing students' involvement in their learning and final seviceablity for intellectual support to local economy.

Keywords: Teaching, Learning, Researching, Project-based Pedagogies, Engineering Education.

1 Introduction

As we all know, the main role of a college is to teach, to research and to serve for the society. The purpose of engineering education is to provide the learning required by students to become successful engineers—technical expertise, social awareness, and a bias toward innovation. This brings great challenges to traditional education. An implicit criticism of current engineering education focuses on prioritizing teaching of theory, including mathematics, science, and technical disciplines, while not placing enough emphasis on laying the foundation for practice, which emphasizes skills such as design, teamwork, and communications. It is imperative that we improve the quality and nature of undergraduate engineering education.

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In last three decades, engineers in industry and government, along with university program leaders, have advocated student involvement for some time as an essential aspect of meaningful learning for undergraduate engineering education. Educators have implemented several means of better engaging their undergraduate students, including active and cooperative learning, learning communities, service learning, cooperative education, inquiry and problem-based learning, and team projects.

In this paper, we focus on the discussion of project-based pedagogies in undergraduates' engineering education *via* strengthening the relationship among teaching, learning and researching. Some practices and suggestions for redesigning some engineering classes and programs have been given.

2 The Relationship among "Teaching", "Learning" and "Researching"

Some say that academic scientists are researchers who also teach. Some say that academic scientists do research to teach. Whatever our sense about the relationship of research and education, there is no question that undergraduate practical experiences offer some of the best teaching and learning that universities have to offer. As early as 1900's, the well-known Germany educator Alexander von Humboldt proposed the principle — to integrate teaching with researching. Prof. QIAN Wei-Chang, the famous scientist and educator in China also stated, "You are not a teacher if you don't teach; You will not be a good teacher if you don't do research." However, it is hard to realize the integration of teaching with researching in practice. How to handle the relationship between research and education is a very important question as well as a major theme in university education. Meanwhile, the learning initiative of the undergraduates, the main bodies of learning, is highly related to the quality of talents cultivation. With the development of industry and economy, the needs for the improvement of practical skills training and innovative thinking training are more prominent in undergraduate engineering education, which demand a relatively high quality teaching staff with both research and practical experiences. It is undoubtedly to be achieved *via* strengthening the relationship among teaching, learning and researching, which can be described as a triangular-interwork as shown in Fig. 1.

Fig. 1. The relationship among "Teaching", "Learning" and "Researching"

Numerous studies and reports over the past 30 years have indicated that good relationship among "Teaching", "Learning" and "Researching" can be achieved by suitable modes, such as team working, tutorial system, *etc*[1~3]. As far back as 1989, a report on the National Science Foundation Disciplinary Workshops on Undergraduate Education noted: "It is clear that the academic community regards the involvement of undergraduate student majors in meaningful research ...with faculty members as one of the most powerful of instructional tools." This was followed in 1996 by publication of the National Science Education Standards: "Students learn such skills as observing, inferring and experimenting." Again in 2003, Bio2010: Transforming Undergraduate Education for Future Research Biologists stated, "To successfully undertake careers in research after graduation, students will need scientific knowledge, practice with experimental design, quantitative abilities, and communication skills. ...All students should be encouraged to pursue independent research as early as is practical in their education." In 2010, Dr. Jo Handelsman, Professor of Yale University, the editor-in-chief of the "DNA and Cell biology", wrote a preface for a special issue of this journal, entitled as "Not Science Fiction: Undergraduates Productive in Research"[4]. The special issue featured a collection of papers reporting on successful research projects in which undergraduate students played a significant role, such as, a paper submitted by Cristina Cardemil and colleagues from Swarthmore College (Pennsylvania) and DuPont Company (Wilmington, DE), describing the development of a bioluminescence-based test that used a bacterium to measure the amount of ammonia and phosphate in water samples. The researchers showed that this method yielded as good or better results as commonly used analytical chemistry test kits that had limited sensitivity. Prof. Jo Handelsman emphasized that "novices bring a fresh perspective" and their "lack of entrenched bias can bring new insights to old problems." "…and undoubtedly learned much in the process."

In my opinion, good relationship among "Teaching", "Learning" and "Researching" can be achieved by both teachers' and students' sides, as described as follows (Fig. 2):

On one side, we can extract some teaching elements from the research products obtained by the teachers or researchers, which represent the need and the front edge of the science and technology or industry.

On the other side, some undergraduates can be involved in some research projects carried out by professors, researchers. The innovation ability and practical ability undoubtedly can be improved *via* training and practising when they are involved in research projects.

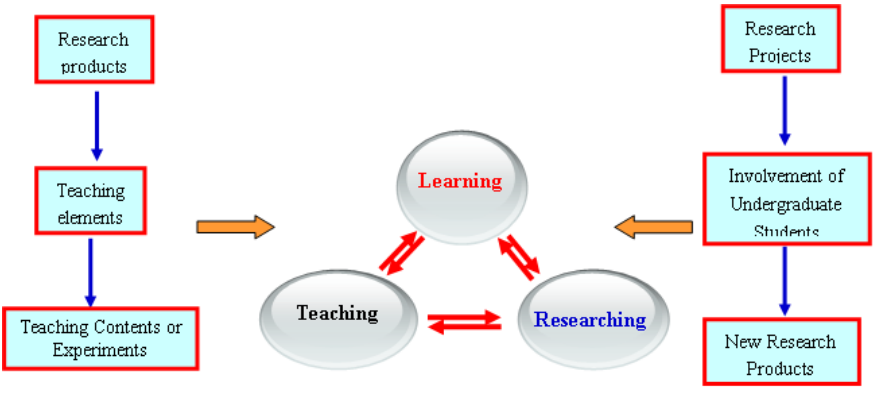

Fig. 2. The possible approach to achieve good relationship among "Teaching", "Learning" and "Researching"

2.1 Project-Based Pedagogies in Undergraduates' Engineering Education

As early as 551 B. C., Confucius had stated, "I hear and I forget, I see and I remember, I do and I understand." Practical Training and undergraduates involvement are receiving considerable attention by engineering education scholars and practitioners. However, the dominant pedagogy for engineering education still remains "chalk and talk", despite the large body of education research that demonstrates its ineffectiveness. There are several examples of project-based learning being used in individual or a few courses in engineering programs that have been reported in literature. The courses reported cover a range of discipline areas and program levels.

The use of project-based learning as a major part of the curriculum is new to engineering. It may be defined in various ways by different educational disciplines and levels. Project tasks are closer to professional reality and therefore take a longer period of time than problem-based learning problems (which may extend over only a single session, a week or a few weeks). Project work is more directed to the application of knowledge, whereas problem-based learning is more directed to the acquisition of knowledge. Self-direction is stronger in project work. Project-based learning may also be applied in individual courses or throughout a curriculum as described by Heitmann[5]. According to Heitmann, project-oriented study involves the use of small projects within individual courses, progressing to a final year project course. The projects will usually be combined with traditional teaching methods within the same course. They focus on the application, and possibly the integration of previously acquired knowledge. Projects may be carried out as individuals or in small groups. Project-organised curricula use projects as the structuring principle of the entire curriculum, with subject-oriented courses eliminated or reduced to a minimum and related to a certain project. Students work in small groups with a project team of teachers who are advisers and consultants. Projects are undertaken throughout the length of the course and vary in

duration from a few weeks up to a whole year, even in the whole range of the 4-year undergraduate education.

Project-based pedagogies in undergraduate engineering education have been carried out in Ningbo Institute of Technology, Zhejiang University. They are based on the key line of major related industry, whilst the project-based learning is persistent in the whole engineering education process. The Project-based pedagogies in undergraduates' engineering education are carried out in three levels, *i. e.,* course-level, major-level, and industry-level, as shown in Fig. 3.

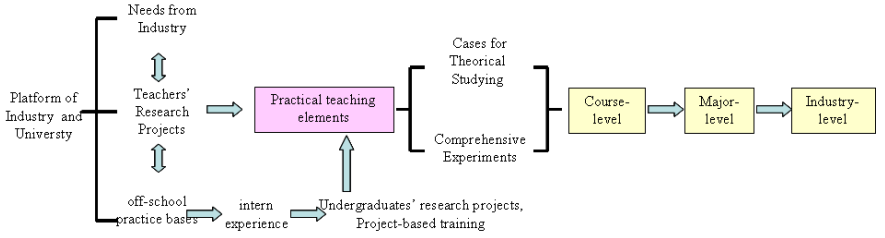

Fig. 3. Project-based pedagogies in undergraduates' engineering education

The projects mainly come from industry through the platform of industry and university. These projects can be either put forward by industry itself, or related to teachers' research projects. Meanwhile, when students are trained *via* intern experience in off-school practice bases, they also can bring back some projects which are really needed to be resolved in industry. All of these projects can be well designed to be practical teaching elements both for theorical studying and comprehensive experiments at course-level. Several related courses can be linked to a practical training group at major-level; moreover, a project-based practical training net for undergraduates' engineering education can be integrated *via* the platform of industry-education-research, teacher's teaching and research products, as well as the students' practice and innovation training *etc*, to form a industry-level, multi-win system. Under such a system, undergraduates can receive comprehensive training which is needed by engineering education. Moreover, the relationship among teaching, learning and research can be strengthened when students are involved in the projects with their teachers.

3 Conclusion

In the context of the requirements of revised accreditation criteria and the calls from industry on what they need from engineering graduates, it would appear that these demands are unlikely to be satisfied by a traditional engineering curriculum and "chalk and talk" pedagogy. Project-based pedagogies *via* strengthening the relationship among teaching, learning and researching have been presented in this paper in order to meet the industry needs, without sacrificing knowledge of engineering fundamentals. The use of project-based learning as a key component of engineering programs should be promulgated widely.

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Exploration and Practice of Basic Computer Teaching Reform under New Situation for Colleges

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Abstract. There exists many problems for basic computer teaching under new situations, such as teaching content is out of date, teaching goal is indeterminately and practice teaching is weak. For these above problems, we carefully designed a teaching reform program, including location teaching goal precisely, renewing teaching content, reforming teaching method, strengthening practical teaching, building online learning platform and improving teaching evaluation system, etc. Experimental results show that our reform program is feasible and effective.

Keywords: basic computer teaching, teaching method, teaching goal, teaching content, teaching evaluation system.

1 Introduction

Basic computer courses are different from the basic courses such as advanced mathematics, with its content changing fast, a strong practice, very large difference of social demand, varied students, requiring teachers to update their knowledge very quickly, etc., so same textbook and same teaching method can not be used by these courses. On the other hand, as professional teaching and scientific research are combined with computer application technology more closely, major make higher demand of computer application ability. The rapid development of computer technology and the growing popularity of computer applications also put forward higher and higher requirements for basic computer teaching. But there are many problems in basic computer teaching for most colleges, such as a serious discrepancy with the professional application, insufficient attention to the requirements for application; still mainly using the lecture-based teaching method, not forming a self-study based teaching method; still have not formed their own characteristics on teaching; course system is not suitable for the needs of the major, many dispersed teaching knowledge points and fewer class hours, difficult to organize the teaching; teaching content updates infrequently; being marginalized in the discipline system ; students' interest in learning is not high; coping with test increased, and so on [1]. But the level of computer technology and computer application ability has become an important measure of the quality of graduates.

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Thus, for each college, how to formulate our own curriculum system is very important according to the "China Fundamental-computing Curricula 2008" [2] and other related documentation requirements, to push forward the reform of basic computer teaching continuously, improve the quality of basic computer teaching effectively. We carried out our reform, including educational idea, teaching content, teaching goal, teaching methods and other aspects. Around strengthen practice and innovation ability, we propose a teaching reform program oriented to "application", not only train students' ability to use computers to solve practical problems, but also benefit cultivation applicable and innovative talents.

2 The Problem of Basic Computer Teaching

At present, the main problems are as follows in basic computer teaching.

2.1 Students and Teachers Themselves

Freshmen are more or less certain foundation of information technology. However, due to discrepancy of different regions, the level of understanding and mastering basic computer knowledge differ greatly for college students, yet some colleges still use the same starting point and a unified teaching progress and requirements to organize teaching. This led some students with a good foundation have no interesting and students with poor foundation can not keep up, even some of the students are addicted to the Internet. At the same time, students recognize the course incomplete, feel that learning the course is useless, and study only for exams, so they can't apply the knowledge to solve practical problems. In addition, the students also face changes in study habits, improvement learning capabilities and other issues.

Teaching ability of teachers is the fundamental factor to improve teaching quality, because of unreasonable allowance distribution system in some colleges, teacher teaching lack enthusiasm. For example, specified upper and lower workload by title in our college, teachers with full workload are not willing to lecture, with inadequate workload have to lecture at least six classes to reach the required workload, and the workload of repeated lesson is also discounted. So a lot of teachers lecture only for enough workload, as to why students need to learn this course, and how to learn is not considered. In addition, the composition of teaching staff is complex and weak, lack of high-grade, highly educated academic leaders, and lack of experienced teachers; the expansion of college enrollment also aggravates the lack of teaching resources, most college used combined lesson to organize teaching, all these affect the effectiveness of teaching.

2.2 Teaching Content

Students of different major have different needs of computer knowledge, and the demand degree of the same content should be different from each other, colleges should be conscious of enabling students to use computers to solve their own major problems. But at present, the teaching content of basic computer is out of date

and divorced from reality; many colleges adopt uniform textbooks, unified syllabus, unified class hours for all non-computer majors, too much emphasis on the pass rates of Computer Rank Examination (CRE) while ignoring the characteristics of various majors, and a serious gap exist between teaching content and major; the requirements of selected textbook and CRE are too complete and systematic, including binary conversion, multimedia technology, and so on, students first encounter a lot of basic concepts, theories and terms, many students reflect that the content of computer courses is too broad, dull, resulting in fear of hardship and aversion learning. The teacher lack investigation of what specific knowledge of student needs in the future, and teaching short of pertinence.

2.3 Teaching Method

The current teaching methods exist the following deficiencies: some still use the method of "blackboard add chalk"; some although adopt multimedia teaching, but still use the teaching style of "cramming method of teaching", students passive acceptance, organization the teaching not taking the strong practice of basic computer teaching into account; some still emphasize some theoretical knowledge which can't be remembered and never to use in the future by students; some organize the teaching casually, low teaching efficiency, the phenomenon of "deal with" at ordinary times, "take an examination" before test is still common; some only teach students how to operate, ignore training the students' computer consciousness, have not taught students how to use the computer effectively; some did not carry out hierarchical teaching according to students' differences, etc. Meanwhile, some teachers abuse multimedia teaching, do not take into account the following deficiency of multimedia teaching [3]: interaction between students and teachers reduced; some courseware is too garish, emphasized the visual and auditory effects, but distracted the attention of students; multimedia teaching with high speed and large amount of information, is difficult for students to take notes, so some students feel unable to keep up with the progress; using multimedia teaching for a long time, students will produce visual fatigue, be tired of this kind of teaching, can't achieving the desired results; multimedia courseware update slowly and so on, all these affect the effectiveness of teaching.

2.4 Teaching Goal

Employers' demand for graduates' computer skills is more and more clear and specific, require students to have more computer knowledge and stronger computer application ability, and computer technology can be closely integrated with their own major in the future work. However, the present, except for computer major, students of the other majors do not know what level of their computer knowledge should be reached and how to service their own majors, so just passing the national or provincial CRE or other similar examination as a teaching goal. This causes computer can not serve major very well and students are low interest in study.

2.5 Practice Teaching

Practice teaching is the main way to master basic computer courses, but now the practice teaching exist the following problems [4]. Firstly, some colleges there are no standard experimental projects and good experimental textbooks, but also lack practical experience teachers with computer applications. Secondly, teaching methods are usually teacher demonstrations, student themselves operate again by according to teacher's demonstration process or the steps in their own training manual, students can imitate the operation, and obtained a lot of operating skills, which can not be linked together to complete their work independently. For example, after learning Office, students can not typeset their paper; after learning Flash, students can not do animation, etc. Classroom change into a pile of functions and skills, but the practical ability of students did not increase significantly, most students think they did not learning anything. Students lack of training of independent analysis problems and problem-solving by this model, understanding basic knowledge and concept remains at the theoretical level, practical training and innovation ability is not enough. In addition, because of poor management, low rate of equipment utilization, computer room rarely open to students except for normal teaching and examinations, even if open there are no professional teachers to guide. This increased the contradiction between less class hours and high requirements for experimental class, and cause weak practice teaching.

2.6 Online Learning Platforms

As more content and less class hours for basic computer, a lot of content can not be taught in class, this requires that we build online learning platforms which facilitate self-learning and enhance exchanges with teachers for students. However, many colleges have not established online learning platforms, even if established, there exists the following deficiencies: meager network resources, inadequate use, the lack of teachers' participation, etc., students can not achieve the effect of independent learning and collaborative learning.

2.7 The Evaluation System

Evaluation system should be able to truly reflect the student's learning ability and learning effects, it determines the direction of teaching, impact on two aspects of teaching and learning directly, and is very important in the whole teaching process. However, the current teaching evaluation system for basic computer there are many deficiencies: single evaluation methods, usually paper based test plus computer based test, and the characteristics of examination-oriented education is very obvious; focus on the ability to memorize knowledge, while ignoring practical ability and creative ability of students; evaluation mainly by the final exam while ignoring the evaluation of the whole learning process, etc.

3 Our Reform Program

3.1 Improving Teachers' Teaching Enthusiasm

Computer technology with quickly update and higher requirements for teachers, requires us to strengthen teaching staff. Our reform program is: introducing high-title, highly educated professionals from university and enterprise; providing teachers with the condition for pursue higher level degrees; laying down rules of training, conducting, competing and participating in engineering practice to the enterprises for young teachers, in order to improve their engineer quality; encouraging teachers to undertake research projects of enterprises, improve their ability of scientific research and engineering practice continuously. At the same time, every year we invite well-known computer experts to come to our college to teach the latest developments in basic computer and send teachers to participate in teaching seminars of basic computer. Teaching staff is made up of basic computer teachers, computer major teachers and other major teachers, planning and coordination the computer teaching as a whole. So that basic computer teaching and major teaching can be integrated better. We can improve the treatment of basic computer teachers and mobilize their enthusiasm fully by reforming the allowance distribution system.

When student enrollment, taking into account huge discrepancies of computer knowledge, we have implemented hierarchical teaching. Solve the problem of recognition the course incorrectly for students, we told students the usefulness of the course being learned. Due to increasing pressure of current employment, students examined the usefulness of the courses. The most concerned for students are what the use is, what areas will use it, what positions will be got after learning it well. If they do not understand above-mentioned content, from the beginning of the course, acceptance of knowledge absentmindedly and passively, most of the students' learning enthusiasm is low undoubtedly. For example, when teaching the C language, we specially use the first class to teach students the major application areas of the C language in the current society, of which highlight the current one of the most popular applications—embedded system development, introduced its characteristics, the degree of talent shortage in the following several years and the salary range engaged in that occupation. After finishing this class, which has played a role in fostering students' enthusiasm for learning C language in the future, students have a clear target to learn the C language. At the same time, during the class, we often emphasize that the C language has the fundamental role for learning the subsequent courses, and let students realize that the C language is very important to learn the subsequent major courses.

3.2 Renew Teaching Content

With the development of computer technology, teaching content of basic computer should be adjusted accordingly. Because of more content and fewer class hours, according to the actual situation, the teaching content should be selective to ensure the basis, highlight applications and update in time. In addition to

regular content, we should also take into account the needs of students and academic development, adding interesting and really useful knowledge for students. For example, in our teaching, we appropriately added the Microsoft Visio, because this section is useful to students' employment. In the arrangement of teaching content, we should be lectures, discussions, assignments, experiments, practice, etc. as a whole to consider, and formation the three-dimensional system of teaching content.

According to the various major requirements of computer applications and social needs of the application talents, researching on how to build a new teaching content is significant, which meet the needs of information age for basic computer, to foster ability of computer applications integration into the various major courses, to improve the situation of a serious discrepancy between basic computer teaching and major application, and to achieve the training target of "proficiency in English, proper use of computer, high quality, strong ability". We found by deeply study: liberal arts students treat computer only as a tool rather than professional pursuits, while science and engineering students combine major study and research with computer technology highly. The main obstacles encountered in using computer by senior arts students is that using basic office software (such as typesetting special format articles using Word in graduation design, etc.) is not proficient; for science and engineering students, in addition to the above obstacles, they also lack of skills in programming (such as editing interface program with C language or VC), lack of applications of large-scale computing software and professional software (such as MATLAB, SPSS) and so on. Therefore, we cooperate with major teachers, determine the specific requirements of computer applications for various majors and the core of lecture, and build different curriculum, set different courses, choose different content and textbooks, and give classified guidance for different major demands. And carry out two levels of teaching—"Basic Computer Teaching" and "Computer Teaching combined with major". The former plays a fundamental and guiding role for cultivating students' knowledge and ability of computer, while the latter mainly carried out by the department's planning determines to a greater extent the ability of solving practical problems by using computer in their own major. Through the coordination between them, computer teaching will be throughout the whole university education, basic computer can not only be blend into more major teaching, but also make major with a more specific goals and requirements of computer applications for students.

In addition to selection a set of textbooks which can reflect the leading edge and feature of computer technology, we also prepared a set of textbooks. Because many current textbooks used the knowledge structure of the computer principles, resulting in basic computer courses boring, difficult to understand, can not achieve the purpose of cultivating ability and application oriented for students. We believe that good textbooks will not only make students feel not tedious, but also stimulate students' creative thought, ignite students' thirst for knowledge. According to the characteristics of students, we edited teaching materials, which can not only enable students to learn basic operation of computer, but also to master the basic principles and methods of computer and the ability to solve practical problems, to focus on cultivation the applied talents. In the process of editing our textbooks, we

tried to use new system, new content and new methods, and referred to the course of Microsoft Office Specialist (MOS) [5], which adopted the "mission driven" teaching method. First, the major function of the Microsoft Office was decomposed and summarized into a number of "themes", and then designed corresponding application instance with a lot of "themes" as its core, and then drew up a set of teaching units using a series of application examples. After finished all the teaching units of the software, students have had the key skills to use the software. After practical operation for a certain time, students can become a skilled expert.

3.3 Carried Out Hierarchical Teaching of Student-Centered and Task-Driven

Teaching is bilateral activities of teachers and students; learning is the goal while teaching is the means, the result of "teaching" is measured by the outcome of "study". Therefore, the teacher not only control "teaching" but also control "study", researching on the cognitive laws of students, on how to accept the knowledge faster, easier and more effective for students in daily teaching, and improve their teaching means and methods continuously with the rapid development of computer technology. In the traditional teaching mode, teachers ignore students' initiative, and can not take into account the individual differences of students. According to the basis and employment of our students, we implemented hierarchical teaching overall, full implementation the teaching mode of "essential teaching and more practice" and "task-driven", to establish the teaching idea of "student-oriented, application-oriented" and "give students a gun, not a quarry", in order to fully mobilize the students' learning potential.

We implemented tasks (projects) driven teaching: it is a student-centered, task-driven teaching, and teachers' teaching and students' study are surrounded by the same goal, based on several tasks, the students learn independently and collaboratively driven by the issue. With the task being carried forward step by step, students can master the relevant knowledge and related operations, and acquire strategies and methods to complete the task, so as to continuously improve their ability to solve practical problems by using composite knowledge. In the specific implementation, teachers need to select the task carefully. The task should be closely integrated with practical application, adapted for the development of computer technology and credit hours requirements, and not only consistent with teaching content, but also combine with the teaching goal. Meanwhile, the same application software may be disassembled in different chapters and sections, teaching task should be gradual and from the beginning to the end, to ensure its integrity and continuity. For example, for VB teaching, we can select calculator in Windows accessory as a complete teaching tasks, which will be taught throughout the whole process of form design, menu design, and control reference and so on. At the same time, we implemented hierarchical teaching to stimulate students' interest, ensured that all students get the most practical optimization services to achieve overall progress, reducing the gap, and improving teaching effectiveness. In view of the levels of using computer variation considerably, we performed a computer proficiency test when students enrolled, separated students into the basic class where

students have poor foundation and the advanced class where student have good foundation. For basic class, we lectured from the foundation, then deepening gradually; for the advanced class, we started from the application directly, mainly operation on the computer. Teachers using different teaching model, given different tasks for students in different hierarchy, so that students at all levels can learn something. Teaching and Research Section worked out syllabus, lesson plan, quality standards, etc, and the department optimized the configuration of teacher in every layer, and according to the results of the final exam, taught all levels of students rolling.

Teaching methods from the early "Blackboard plus chalk" to later "Computer plus big screen", and to the current "network teaching platform" [6], reflects its constant change. We should not only attention use a variety of teaching methods, but also the proper use of these means which should be obey the teaching content. For example, electronic courseware which can ease the conflict between more teaching contents and less credit hours has a lively, vivid, visual characteristic, but has reached the point of abuse. We believe that the fundamental purpose of using and selection of courseware is to break through the teaching difficult points, and using courseware should not affect the authenticity, integrity of the teaching process, and should consistent with the progressiveness of students' thinking. It is only when conventional teaching means can not solve the teaching difficult points commendably that we consider using courseware to really play a supporting role in teaching. Meanwhile, the courseware should have scientificity according with discipline law, artistry according with the psychology and interestedness according with the age characteristics of the students. Because there are some drawbacks of electronic courseware, we ask teacher must have a certain amount of writing on the blackboard, and arrange appropriate class discussions.

3.4 Precisely Goal

There are a lot of answers to the question of teaching goal of basic computer. Some believe that students learn more computer courses, test a certificate to obtain employment easily; some believe that computer application techniques which is a basic knowledge should be learned, some students even ready to give up their own major and learn more computer courses to change their profession easily in the future. These viewpoints have their own reasons, but do not grasp the essence. Through years of teaching practice and research, we believe that capacity-building and application-oriented are the goal of basic computer teaching in colleges. It not only enable students to master the basic knowledge of computer and information technology, and also can cultivate and improve students' ability to analyze and solve problems by using computer technology and related technology, to lay a solid foundation for the computer being used in the professional application. Along with social progress and development of higher education, the goal of basic computer teaching should also be adjusted constantly, and we think students should have the following capabilities.

Operative ability: the most basic ability to process information by using computer, such as the use of commonly used software, etc., is a basic requirement of

each college student; application development capabilities: refers to the ability to use computer technology in their own specialty areas on the basis of operative ability, students can handle their professional business efficiently and solve simple practical problems by combination of computer technology with their expertise; research and innovation capacity: refers to the ability with a strong sense of innovation for the students, who are good at acquiring new knowledge by independent learning and can work independently and creatively. In addition, we need to cultivate their ability of scientific computing for science and engineering students. Currently, we use the purely scientific computing language such as MATLAB, Maple instead of the C language.

3.5 Strengthen Practice Teaching

Basic computer course itself is highly practical course, to learn it well must more training, more practice. Practice teaching is very important for students to both master computer theories and train students' ability to solve related problems by using computer. But in fact, some colleges did not attach importance to practice teaching, we thought practice teaching and theoretical teaching were equally important, and took the following measures.

We revised the experimental teaching plan and syllabus; prepared experimental textbook and experimental projects; established a steady experimental staff with fine ideology and business. Thus we changed the practice teaching which was in secondary status, highlighted to train the students' application ability. At the same time, on the premise of not affecting the normal teaching, we adhere to the lab open to students around the clock, to provide good conditions for students to practice.

We use task-driven teaching for experiment class, ask students to preview before class and write experimental report after class, to summarize the harvest and the lack in the experiment. This mode emphasizes using the basic operation flexible, focus on students' practical skills and sense of innovation and use different tasks lead students in various majors. So that students can refer to nothing, and have to complete independently according to their own understanding and ability. While each student's design and the works are not the same, but this mode inspire the students' thought and develop their independent problem-solving abilities. We divided experiment into three levels: validating experiments which solve a simple problem account for 40%; comprehensive experiments which need apply the knowledge comprehensively account for 30%; and the last type is the innovative experiments which require students have a strong sense of innovation, accounting for 30%, too. In the future we will gradually reduce the type of validating experiments, increase comprehensive and innovative experiment. In addition, we also carried out various forms of practice teaching, such as the second classroom teaching, and encourage students to participate in a variety of computer skills competition.

3.6 Building Online Learning Platform

We fully developed a teaching web site of basic computer, which is necessary for basic computer teaching, built a robust teaching support environment, to break the

boundaries of time and space of classroom teaching. Web site provides a wealth of teaching resources and interactive teaching environment for teachers and students, to meet the individual learning of students, is of great benefit for cultivating students' creative ability, so that students can change the knowledge learned into practice ability really. Online teaching has a feature of open learning resources, interactive learning process, selecting learning content independently, forms of the content in multimedia, and so on. Our online learning platform includes all kinds of teaching materials, online self-test and online work; online exchanges, online answer, and so on.

All of the online teaching resources open to students, to be gained improvement and perfection continuously based on the teaching practice. Thus, we formed a three-dimensional teaching environment of classroom teaching, experimental teaching and online teaching, and effectively mobilized the study enthusiasms.

3.7 Improving the Teaching Evaluation System

To improve the quality of teaching, we need a scientific, standard and refined management to the teaching process, and establish the quality evaluation system which can reflect learning effect, can assess students' learning ability, practical ability, problem-solving skills and learning attitude, etc., can play a role of examination, analysis, evaluation and feedback for teaching, can also promote students' practice ability and innovative ability. The current evaluation system has many problems, such as in some colleges CRE (national or provincial) are still regarded as the main evaluation criteria for basic computer teaching. We believe that the forms, methods and contents of the assessment should be diversified, adhere to the principle of "scattered examinations mainly, centralized examinations supplemented", and examine throughout the teaching process. Our specific assessment method is: total grades is the sum of regular grades and final exams grades (each accounts for 50%), and the regular grades includes work (including operation on the computer) grades, classroom grades and attendance grades (accounts for 70%, 10%, 20%, respectively), the final exams grades includes paper based test grades and computer based test grades (each accounts for 50%).

Exams routinely guides students further deepen their understanding of related knowledge points, to lay the foundation for integrated applications; paper based test examines the degree of mastering the basic knowledge and the ability of integrated knowledge; computer based test is a process to strengthen the practice, aims to improve students' operation ability. Only these three combined, can we truly reach to goal of evaluating learning effect properly. After reforming the evaluation system, our schemes are approved by all the teachers and students, because we focus on the learning process, highlight the students' comprehensive ability.

4 The Results of Our Scheme

In the 2008 – 2010 academic years, we carried out a comprehensive reform on basic computer course; the reform program was applied in basic computer teaching

in 30 different majors from Grade 08, 09 and 10 of our college, the results show that our scheme is feasible. Our students participated in CRE of Sichuan province, among them, Grade 2 examination are divided into C language and VFP. After implementation of the reform, students' pass rate was increased significantly in CRE of Sichuan province, the specific situation was in Table 1. As can be seen from Table 1, basic computer teaching in our college reached a new level, because we mobilized students' study enthusiasm after the reform, and lead to more and more students study initiatively.

Table 1. Table of the students from all grades passed the CRE of Sichuan province

Students' Grade	The pass rate of CRE of Sichuan province		
		Level 2	
	Level 1	VFP	C language
Before Grade 08	51.2%	20.4%	9.7%
Grade 08	94.7%	48.7%	16.5%
Grade 09	95.3%	51.3%	17.4%
Grade 10	96.6%	54.5%	18.5%

5 Conclusions

We believe that teachers in colleges are no longer merely "teach" teachers, but above all should be "lead" teachers, to guide students learn by themselves, and establish a teaching idea of "student-centered" and "professional applications oriented". In teaching, we construct three-dimensional teaching environment by full use of classroom, computer room, network, and extra-curricular, improved teaching methods, established the teaching evaluation system fitting for our college, and mobilized the students' enthusiasm, cultivated students' self-learning ability. We have done a certain amount of exploration and research on basic computer teaching, but improving the quality of basic computer teaching is a long-term task, teachers should research on content and methods of teaching, and make it further improvement.

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Overall Course Design Method Based on Working Process—Illustrated by the Course of *Mechanical Components Design*

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Abstract. Course teaching based on the working process is an effective teaching mode to make the training objectives meet the requirements of "Comprehensive professional capacity" proposed by the higher vocational education. This kind of teaching mode breaks the order of traditional subject system, fuses the learning process with the work, and links the theoretical study of students with professional ability and personality development. Illustrated by a course of *Mechanical Components Design*, the design methodology for the entire curriculum based on the working process is discussed from several aspects such as teaching objectives setting based on investigation and analysis to post, design of teaching content with work task oriented, organization of teaching with integrity of the structure for the work process, reform of learning inspection with work products as the content etc., and this methodology has been proved to be effective by practice.

Keywords: Overall course design, Working process, Mechanical components design, Comprehensive professional capacity.

1 Introduction

It's very important for the overall course design to make the training objectives meet the requirements of "Comprehensive professional capacity" proposed by the higher vocational education. The effect of the overall design is directly related to the teaching quality and the cultivation of students' professional ability especially for this kind of specialized fundamental course such as the course of *Mechanical Components Design*.

The overall course design method based on working process is that the order of traditional subject system is broken, and the learning process is fused with the work, the theoretical study of students is linked with professional ability and personality development, the using ability and creative ability is emphasized in the training objectives[1]. This method that theory is combined with practice and book

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knowledge is combined with the actual operation is conducive to the cultivation of professional competence of students, and helps students grasp the process knowledge of the actual work to obtain the required comprehensive professional ability[2]. This also corresponds with the positioning needs of the higher vocational education which raises the high-skilled personnel who face the front-line need for production, construction, service and management.

This paper will be illustrated by the course of *Mechanical Components Design* to discuss the design methodology for the entire curriculum based on working process.

2 Teaching Objectives Setting Based on Investigation and Analysis to Post

The teaching objectives in accord with the professional ability must be established at first for the course teaching based on the working process, and the teaching objectives setting should be based on investigation and analysis to post. During the overall design process for the course of *Mechanical Components Design*, we have determined the professional posts (as shown in Fig. 1) which the curriculum faced through tracking and investigating the employment status of the graduates nearly three years, interviewing with enterprise staff for many times, inviting the enterprise expert, curriculum development experts and school professional teachers to hold the curriculum development conference. Among these posts the product design is the directly related jobs of the curriculum, the others are the indirect corresponding posts. The curriculum should build the solid foundation for the knowledge, the skill and the accomplishment which the posts showed in Fig. 1 need.

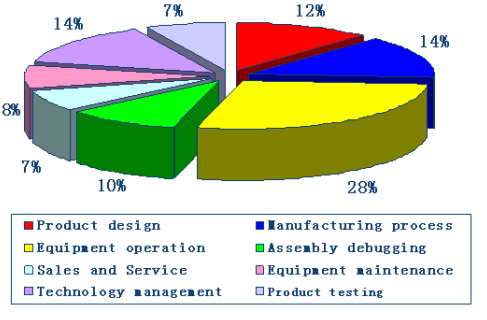

Fig. 1. Distribution of the professional post for the course of *Mechanical Components Design*.

Then the teaching objectives is set based on investigation and analysis to post and combined with the requirements of the curriculum basic content, that is which theoretical knowledge, professional skills should be mastered by the students and what kind of professional level should be achieved by the students.

3 Design of Teaching Content with Work Task Oriented

Teaching content should be selected around the objectives of teaching with work task oriented, which starts from the cognitive rules and basic knowledge, basic theory meeting the actual work, and takes the cultivation of professional ability as the core. We can design several learning situations as teaching content according to the requirements of post capacity and the training objectives of course, then arrange the task gradually and integrate the theoretical knowledge and the skill-raising into the situation.

For the course of *Mechanical Components Design*, we select the teaching content on the basis of the objectives of teaching by breaking the order of original subject system, and reorganizing the sequence of Engineering Material and Heat Treatment, Engineering Mechanics, Mechanical Principle, Mechanical Parts etc. We combine the elementary theories, the essential methods with design task of the typical spare parts, and intersperse the declarative knowledge in the process knowledge. Students can come into the role of work as quickly as possible by acquiring the knowledge and skills in the real task of design.

We have designed five learning situations specifically which are recognition of the typical mechanical parts, design of the common mechanism of an internal-combustion engine, design of the screw jack, design of the gear pump, design of the gearing of a belt conveyor. The task and learning objectives of the five situations is given in Table 1. These five learning situations from simply to complex and single to comprehensive are based on the working process, which meet the requirements of the cognitive rules of the students. The students are trained repeatedly in the learning situations and finally complete the knowledge construction, skills training and quality development of this course, which the students achieve the goal of training for comprehensive vocational ability.

Table 1. Selection of teaching content.

Learning situations	Task name	Learning objectives
1.Recognition of the typical mechanical parts	1.1Recognition of the machine	This is the links of preliminary understanding of mechanical and practice by the students, which emphasizes to raise the observation ability, beginning ability and preliminary cognition machinery ability of the students.
	1.2Recognition of the typical components	
	1.3Recognition of the mechanical elements	
2.Design of the common mechanism of an internal-combustion engine	2.1Structure analysis of an internal-combustion engine	Taking the common mechanism of an internal-combustion engine as the carrier, make students learn to draw the motion diagram of planar mechanism and judge the certainty of mechanism motion, learn to design simple planar four-bar linkage and learn to design the profile curve of disk cam.
	2.2Drawing of planar mechanism diagram and calculation of degree of freedom	
	2.3Design of planar linkage	
	2.4Design of cam mechanism	
3.Design of the screw jack	3.1Structure analysis of an screw jack	Taking the screw jack as the carrier, make students learn to analyze the characteristic and application of different types screw joint and master the design process and method of screw drive, cultivate the ability of designing structure, consulting the related manual and technical data, and using the national standards correctly.
	3.2Design of screw drive	
	3.3Design and calculation of the screw jack	
4.Design of the gear pump	4.1Structure analysis of the gear pump	Taking the gear pump as the carrier, make students learn the design method of spur gear drive and the structure design of axis, master the design process and method of gear pump, further improve the ability of consulting the related manual and technical data, and using the national standards correctly.
	4.2Design of spur gear	
	4.3Design of axis	
	4.4Design and calculation of the gear pump	
5.Design of the gearing of a belt conveyor	5.1Structure analysis of the gearing of a belt conveyor	Through designing and training of this comprehensive production project, make students consolidate and deepen the knowledge studied, master the basic skills of experience in estimating and so on, cultivate the ability of analysis and solution engineering problems, cultivate good occupational ethics as well as team spirit.
	5.2Design of Selection for the electric motor	
	5.3Design of belt drive	
	5.4Design of reducer	
	5.5Design of drawings for the gearing of a belt conveyor	

4 Organization of Teaching with Integrity of the Structure for the Work Process

The course based on the working process should keep “the integrity of the structure for the work process”, that is to organize the teaching content according to the basic structure of completing work process which is six stages (following referred to as the "six steps”) of clearing about the duty or getting information, planning, making decisions, implementing, checking, evaluating and feedback[3]. This can make the students acquire knowledge and master skills in close to the real work environment.

Organization and implementation of teaching content will be illustrated by the example of the fifth learning situation of *Mechanical Components Design* course (as shown in Fig. 2). This learning situation consists of five tasks. Before the students receiving each task, the teacher has distributed the table used for work such as task list to the students at first so that the students will be clear about the task of design and ready to carry out the task ahead of time, then organize teaching by using the “six steps”. During the teaching process, the teacher groups the students according to five people for each group. Members of each group are composed of three grades of learning ability with good, medium, bad to help cooperation study.

We adopt “six steps” to organize teaching and regard students as foundation, fuse "teaching, studying, doing" as one, thus realize the fusion of the theoretical teaching and the cultivation of the actual operation skills, and make the students transform gradually from the passive learning into the active learning. During the students carrying out the design task of mechanical components, they are pushed to explore new knowledge and learn new skills, their comprehensive professional capacity is also cultivated, which lays the foundation for study of the following curriculum and adaptation of the operating post.

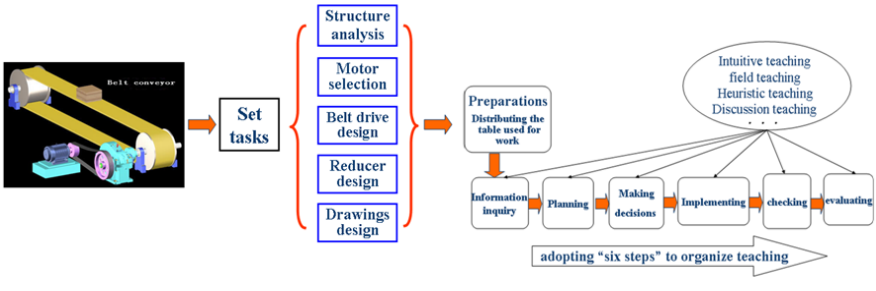

Fig. 2. Organization and implementation of teaching

5 Reform of Learning Inspection with Work Products as the Content

Inspection system after the reform of the course comprises the process inspection and terminating inspection, and the process inspection is used as the main part of evaluation methods (for example the process inspection taking up seventy percent, terminating inspection taking up thirty percent). Unit inspection of learning situation is adopted in the process inspection which pays attention to the students' personality characteristics and references to the evaluation contents and forms for the staff completing a task in the enterprise[4]. This inspection of process focuses on the overall evaluation which reflects the ability by work products. The terminating inspection emphasizes the ability of the comprehensive application of knowledge which explains the method with basic principles and basic theory by way of examination for theory.

6 Effects of Practice and Evaluation

The final results of the overall course design should be embodied in the effect of curriculum implementation, and be reflected from student's study quality, student's employment rate and the value which the student can create for the society.

Curriculum reform based on the working process of the course *Mechanical Components Design* has received significant effects of which the students can actively participate in teaching process and their learning interests obviously improved. Through investigation, the students give a good evaluation, they think that by the learning method based on working process, they have not only learned the necessary professional knowledge, but also have learned a rigorous study, work attitude and teamwork ability, and the ability of problem-analyzing and solving has been improved also. They feel a great sense of accomplishment to see the drawings they have designed personally. The design for the entire curriculum of *Mechanical Components Design* has also been recognized by peers and was named the construction project of exquisite course in Zhejiang province in 2010 year. The enterprises agree with the results from this teaching model of “the combination of learning and work” more. An employment rate of our mechatronics graduates reaches as high as 98% above and satisfaction of employers also above 90% in 2010 year, even many enterprises which the students go on duty for practice or employment come to our school to set up the scholarships for students.

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Efficiency Frontier for Chinese Stock Markets under Influence of Financial Crises

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Abstract. The purpose for this research is to find out the influence of financial crises on Chinese stock market and focus on efficiency frontier. For research methodology, the efficiency frontiers are built through linear programming with an optimization model for Chinese stock markets portfolios in different periods and for a portfolio from Chinese, UK and USA stock markets together under current financial crisis. This research finds out that Chinese markets have positive risk return trade off and it varies under the influence of financial crises and if further diversified with western markets, higher investment efficiency can be achieved. This paper offers a suitable method to construct Chinese stock market efficiency frontier, and suggests that further diversification can improve investment efficiency currently. This paper enjoys the originality that it perhaps is the first paper to build Chinese stock market efficiency frontier through linear programming.

Keywords: Efficiency Frontier, Linear Programming, Portfolio Theory, Financial Crisis.

1 Background

Financial crises, like Asian financial crisis in 1997 and credit crunch from USA in 2007, have huge influence worldwide. The current financial crisis developed with a speed which is faster than our most ambitious forecasting. At its very beginning—the mid of 2007, it was an USA subprime lending crisis. But at the end of 2009, it was a big recession globally. With the development of this crunch, more and more economists believed that this crisis is different compared with other recessions not only for its deep and wide influence, but also for some special features within it. Nowadays, the global economy does not walk out of this crisis entirely from an overall view although some indices do indicate the sign of economic renaissance.

China's economy is one of the most important economies worldwide. Chinese capital market is one of the most important emerging capital markets as well. Under the dominoes influence of this crisis, it is quite sure that China undertakes huge lost.

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1.1 Chinese Stock Markets

Chinese stock markets established in 1990. Currently, there are two stock markets in Chinese mainland: Shanghai Stock Market and Shenzhen Stock Market. The basic trend during their tough development is trying to be more rational, more efficient and more global. With the sustainable growth of Chinese economy, Chinese stock markets grew rapidly in the past 20 years.

But first of all, Can stock market be a good method to boost economy? Minier critically discussed the relationship between the establishment of a stock market and the growth of economy and found that the result is ambiguous in the long-run (Minier 2009).

However, Chinese stock markets have already been established. Naturally, people focus on the efficiency of Chinese two stock markets. C. Jeremy finds out that the more and more sophisticated professional investors in the stock market can improve the efficiency as a whole and meanwhile they will improve the behavior of crowding and leverage creation (Jeremy 2009). So, it is not necessarily true that with the development of the stock markets, the efficiency of the markets must be improved.

From the first beginning, Chinese stock markets had their own features. As its banking system, Chinese stock markets are government-oriented. Qinghua, Chung-Jen and Bing-Xuan discussed the government role in the reform of China's banking system and the corresponding interaction between stock markets in China (Qinghua, Chung-Jen and Bing-Xuan 2008). Although Chinese banks lack experience in banking systems' management, but the reform in this system is still a good example which is reflected from the performance of its stocks in the markets.

Zhou and Sornette studied the anti-bubble action and the reaction of Chinese stock markets and the real estate market (Zhou and Sornette 2004). With several years rapid development, the Shanghai Composite Index (SHCI) and Shenzhen Component Index (SZCI) were much higher than they should be and this was what we called overvalue of stock market, or commonly, the "bubble stock market". The anti-bubble action during 2004 made more than one third of the total market value disappeared. Meanwhile, this action dropped China's real estate price at that time.

Leahy also recorded that anti-bubble action from a different viewpoint (Leahy 2004). The size of Chinese stock market is so huge and is the second one in Asian market. In the 500 billion RMB total capitalization, only 200 billion RMB capitalization can be traded in the market and the rest is state-owned. This is the huge equity problem in Chinese stock market and Leahy thought that it was this problem which caused Chinese stock market overvalued.

Not only in practice, but also in research, Chinese nurture their stock markets. Zhou, Xu, Cai et al. point out the statistical features for Chinese stock market by focusing the data spanning from January 2006 to October 2007, which was a big bull market and from January 2001 to December 2005, which was a big bear market (Zhou, Xu, Cai et al. 2009). By using the statistical indices of log-return $r(t)$ for both markets, three important features were found and these statistical features help understanding Chinese economic systems.

2 Efficiency Frontier

Portfolio theory is the first theoretical landmark during the research of modern investment. The basic viewpoint of this theory is that investors can invest into many assets at the same time and this investment behavior can achieve the relative same level of return with a substantial lower risk level. Portfolio theory has a premise that investors are risk-averse. If they take on risk, they must get corresponding return.

Portfolio theory makes it possible first time that investors can measure risk return trade off quantitatively. This theory tremendously changes investment behavior. Nowadays, people think it is rational to invest into a portfolio rather than an individual stock. It is meaningless to discuss risk level without a portfolio.

Efficiency frontier is built up by those special portfolios which have two features. One is that the portfolios in efficiency frontier have the highest rate of return compared with other portfolios which have the same risk level; the other is that the portfolios in efficiency frontier have the lowest risk level compared with other portfolios which have the same rate of return. Geometrically, efficiency frontier is a curve which is combined by all these portfolios.

The construction of efficiency frontier is the first important step in modern investment practice. Unfortunately, to construct efficiency frontier with high quality is not so easy and it is still a hot issue in research. Kumar and Gulati use linear programming in 2010 to construct efficiency frontier for 27 public sector banks operating in India and find out that high efficiency does not necessarily create high effectiveness and performance (Kumar and Gulati 2010).

New techniques are used to improve portfolio building. Huang applies fuzzy theory and VPRS (Variable Precision Rough Set) model in order to build a better portfolio through stock forecasting and stock selection (Huang 2009).

Some researches (Kim and Yoo 2009, Levy 2009) argued that with the liberalization of stock market, investors can improve their investment efficiency by constructing their portfolio worldwide. Their research supports the basic viewpoint that the less market limitation, the larger return will be achieved.

To further improve the investment efficiency, the risk and return trade off during investment is carefully researched. Through the extreme value theory framework and value at risk estimates, Liow provides a development for portfolio construction with the consideration of extreme risk (Liow 2008).

Cai, Liu and Mase analyzed the performance of IPO and its further development in the stock market to help improve investment efficiency (Cai, Liu and Mase 2008). Bitzenis, Tsitouras and Vlachos tried to determine the inward FDI by MNCs worldwide and the impact on stock market in Greece through a questionnaire survey (Bitzenis, Tsitouras and Vlachos 2009). The outcome is Greece should improve its attractiveness by modernizing and updating market mechanisms. These researches help to improve investment efficiency as well.

3 Research Method

The method for this research is quantitative and qualitative as well. The empirical researches are quantitative. Three empirical researches are used to investigate the expected return, volatility, variance, covariance, and efficiency frontiers of stock markets and offer quantitative outcomes. This research uses classical statistics to estimate the risk level of index returns, and correlation of index returns; uses linear programming to construct efficiency frontiers.

This research is also a theory testing, or positivist research. The research objectives are achieved through positivist research mainly. However, research objectives can not be achieved entirely through empirical analyses. Qualitative analyses are unavoidable here and commonly the deductive, however some inductive reasoning is used to get the final results.

A combination of case study design, cross-sectional design, longitudinal design and comparative design is used in the research.

This research uses Office Excel, and SPSS to achieve data analysis.

3.1 Data Source and Collection

Only secondary data has been used in this research. Specifically, the datasets used are: Shanghai Composite Index (SHCI), Shenzhen Component Index (SZCI), Financial Times Stock Exchange 100 (FTSE100) and Standard & Poor's 500 (S&P500).

To test whether further diversification can improve investment efficiency, we choose UK stock market and USA stock market as two cases to represent outside stock markets in our study here.

The data of SHCI, SZCI are obtained from Guo Tai An academic database (Guo Tai An 2011), which is one of the leading economics and finance academic databases in China. The data of FTSE100 and S&P500 are obtained from a business website—yahoo finance (Yahoo 2011).

The SHCI, SZCI, FTSE100 and S&P500 are sub-divided into the following four cross-sectional subsamples: period before Asian financial crisis (06/30/1995 – 06/30/1997); period during Asian financial crisis (07/01/1997 – 12/31/1998); period between two financial crises (01/01/1999 – 06/30/2007) and period during current financial crisis (07/01/2007 – 12/31/2010).

3.2 Samples

It is widely believed that the time span of Asian financial crisis is from the July 2, 1997 (When Thai government announced that fixed exchange rate system of Thai Baht was abandoned) to December 31, 1998 (When Russian economy initially began to go out from its deepest recession).

The current financial crisis begins as a subprime credit crunch in the USA in the summer of 2007 and now it is still not the end. So, it is determined in this research that the current financial crisis is from the July 1, 2007 till now. The dataset is obtained till December 31, 2010.

A dataset for daily trading record in two years is enough for the majority of empirical study, including time series analysis. Based on the empirical study design for this paper, we choose daily trading data from June 30, 1995 to June 30, 1997 as a sub-sample representing the period before Asian financial crisis.

To sum up, by using cluster sampling method, we sample the dataset as following: daily trading data from June 30, 1995 to December 31, 2010 for SHCI, SZCI, FTSE100 and S&P500.

4 Data Analysis and Results

4.1 Return and Risk

If we define expected return (mean) as the arithmetic average return for the period, then the statistical expression of expected return is:

$$E(r) = (\sum_{i=1}^{n} \frac{P_{i+1} - P_i}{P_i}) / (n-1) \tag{1}$$

where P_i is the closing price for the ith trading day, P_{i+1} is the closing price for the $(i+1)$th trading day and n is the total number of trading days during a specific period. $E(r)$ is the expected return.

Then, the statistical expression of standard deviation (risk level) is:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n} (r_i - E(r))^2}{n}} \tag{2}$$

where $\sqrt{\ }$ represents the positive square root of variance, σ^2; r_i refers to $(P_i - P_{i-1})/P_{i-1}$ and is the return for ith trading day; $E(r)$ is the expected return and n is the total number of observation.

4.2 Variance and Covariance

It is also necessary for us to test the correlation between stock markets before efficiency frontier construction. According to portfolio theory, any portfolio within efficiency frontier is a portfolio without any unsystematic risk. Correlation between securities (or markets) reflects ability to eliminate unsystematic risk. Covariance is a classical statistic to measure correlation between random variables. We use classical definition of covariance and the equation is:

$$\sigma_{j,k} = \mathrm{cov}(r_j, r_k) = E(r_j - E(r_j))(r_k - E(r_k)) \tag{3}$$

where $\sigma_{j,k}$ and $\mathrm{cov}(r_j, r_k)$ refer to covariance between expected return from security *j* (or market *j*) and security *k* (or market *k*); r_j is a random variable which means the observation of actual return of security *j* (or market *j*) and r_k is a random variable which means the observation of actual return of security *k* (or market *k*); $E(r_j)$ and $E(r_k)$ are expected returns of security *j* (or market *j*) and security k (or market k), respectively. By definition, if j equals k, the result of eq. 3 is variance.

4.3 Efficiency Frontier

The basic idea is, first we figure out return, risk, variance and covariance, and then we put them into an optimization model as input data so that we can construct an equally-weighted portfolio to determine a specific portfolio expected return. Then we try to find out the minimum portfolio variance for this specific expected return by adjusting investment weight for each market. The optimization model used here is:

$$\text{Min. } \mathrm{var}_p = \sum_{j=1}^{m} \sum_{k=1}^{m} w_j w_k \sigma_{j,k} \tag{4}$$

$$\text{Subject to: } \sum_{j=1}^{m} w_j = \sum_{k=1}^{m} w_k = 1$$

$$\sum_{j=1}^{m} w_j E(r_j) = \sum_{k=1}^{m} w_k E(r_k) = cons.$$

$$w_j, w_k \geq 0$$

$$(j, k = 1,2,3,...m)^*$$

where var_p refers to variance of portfolio; w_j and w_k refer to the investment weights of the *j*th and the *k*th security (or market) in the portfolio; $\sigma_{j,k}$ refers to the covariance between the *j*th and the *k*th security (or market) in the portfolio; $E(r_j)$ and $E(r_k)$ refer to the expected return for the *j*th and the *k*th security (or market) in the portfolio; *cons.* refers to a constant. "*" represents this constraint is optional.

The result from the above optimization model can be used to pinpoint just one point within the curve of efficiency frontier. To get more points so that we can link those points with a curve, we repeat our calculation on the above model by changing the constant figures gradually. Finally a curve is constructed. And the

portion within this curve, from the minimum variance point to the right-hand side, with upward sloping, is the efficiency frontier that we wanted (Bodie et al. 2004).

Efficiency frontier can be constructed with or without short sales. Constructing an efficiency frontier with the optional constraints in Eq. 4 means that short sales are not permitted. Otherwise, short sales are permitted. If short sales are permitted in a market, they will make investment more efficient. For short sales are permitted in China at present, we construct efficiency frontier without the optional constraints in Eq. 4. The efficiency frontiers constructed in this paper are all unrestricted frontiers. This means they are constructed with short sales.

We use excel solver to achieve linear programming. In the following efficiency frontiers, the points with "*" are minimum variance points.

Table 1. Chinese Stock Markets Efficiency Frontier during 06301995—06301997

Mean	Std. Dev.	MarketsWeights			
		FTSE100	S&P500	SHCI	SZCI
0.0007	0.017889*	--	--	0.843957	0.156043
0.000798	0.0179	--	--	0.5	0.5
0.0008	0.017915	--	--	0.491	0.509
0.0009	0.019092	--	--	0.138042	0.861958
0.001	0.021256	--	--	-0.21845	1.218446
0.0011	0.024106	--	--	-0.5714	1.571403
0.0012	0.027441	--	--	-0.92436	1.924361
0.0013	0.031068	--	--	-1.27379	2.273789
0.0014	0.034957	--	--	-1.62675	2.626747
0.0015	0.039046	--	--	-1.98323	2.983235

Table 2. Chinese Stock Markets Efficiency Frontier during 07011997—12311998

Mean	Std. Dev.	Markets		Weights	
		FTSE100	S&P500	SHCI	SZCI
-0.0002	0.015071*	--	--	0.838622	0.161378
0	0.015118	--	--	1.004846	-0.00485
0.0001	0.015177	--	--	1.087545	-0.08754
0.0002	0.015258	--	--	1.170243	-0.17024
0.0003	0.015361	--	--	1.252115	-0.25212
0.0004	0.015486	--	--	1.334814	-0.33481
0.0005	0.015634	--	--	1.417512	-0.41751
0.0006	0.015804	--	--	1.501038	-0.50104
0.0007	0.01599	--	--	1.58291	-0.58291
0.0008	0.016199	--	--	1.665608	-0.66561

Table 3. Chinese Stock Markets Efficiency Frontier during 01011999—06302007

Mean	Std. Dev.	Markets Weights			
		FTSE100	S&P500	SHCI	SZCI
0.0007	0.014955*	--	--	1.079696	-0.0797
0.00075	0.0151626	--	--	0.7337945	0.2662055
0.000784	0.015471	--	--	0.491664	0.508336
0.0008	0.0156429	--	--	0.3878935	0.6121065
0.000825	0.0159780	--	--	0.2149429	0.7850571
0.00085	0.016388	--	--	0.035074	0.964926
0.000875	0.0168193	--	--	-0.1309581	1.1309582
0.0009	0.017331	--	--	-0.30834	1.308336
0.00095	0.018471	--	--	-0.65673	1.656728
0.001	0.019755	--	--	-1.00263	2.002629

Table 4. Chinese Stock Markets Efficiency Frontier during 07012007--12312010

Mean	Std. Dev.	Markets Weights			
		FTSE100	S&P500	SHCI	SZCI
0	0.02437*	--	--	0.955991	0.044009
0.0001	0.024525	--	--	0.730827	0.269173
0.0002	0.02487	--	--	0.501114	0.498886
0.0003	0.025389	--	--	0.273676	0.726324
0.0004	0.026075	--	--	0.046238	0.953762
0.0005	0.026914	--	--	-0.1812	1.1812
0.0006	0.027894	--	--	-0.40864	1.408638
0.0007	0.028999	--	--	-0.63608	1.636076
0.0008	0.030216	--	--	-0.86351	1.863514
0.0009	0.031546	--	--	-1.09323	2.093227

Table 5. International Stock Markets Efficiency Frontier during 07012007—12312010

Mean	Std. Dev.	Markets Weights			
		FTSE100	S&P500	SHCI	SZCI
-0.0004	0.01567342	0.34877436	0.31952845	0.50118675	-0.1694896
-0.0003	0.01561012*	0.34796356	0.29910543	0.31955543	0.03337558
-0.0002	0.01580587	0.34715282	0.27868234	0.13792417	0.23624067
-0.0001	0.01625887	0.34634202	0.25825934	-0.04370717	0.43910581
0	0.01693999	0.34552309	0.23763213	-0.22715484	0.64399962
0.0001	0.01781623	0.34472033	0.21741346	-0.40696996	0.84483617
0.0002	0.01888811	0.34390947	0.19699055	-0.58860138	1.04770136
0.0003	0.02008564	0.34309862	0.17656762	-0.77023278	1.25056652

Table 5. (*continued*)

0.0004	0.02143176	0.34228770	0.15614479	-0.95186427	1.45343183
0.0005	0.02286670	0.34147683	0.13572189	-1.13349570	1.65629701
0.0006	0.02438529	0.34066605	0.11529886	-1.31512701	1.85916210
0.0007	0.02595668	0.3398552	0.09487760	-1.49675848	2.06202733
0.0008	0.02761750	0.33904426	0.07445314	-1.67838994	2.26489255
0.0009	0.02930963	0.33823342	0.05403020	-1.86002133	2.46775772

5 Conclusion

The above results indicate that positive risk return trade off is always maintained during the entire period. This means Chinese markets have investment value, or investors can make money with them. The risk return trade off varies under the influence of financial crises.

China improved its investment efficiency during the first crisis. From the mean and standard deviation of the efficiency frontiers before and after Asian financial crisis, we find under the same mean level, the standard deviation is lower during crisis. This means higher investment efficiency.

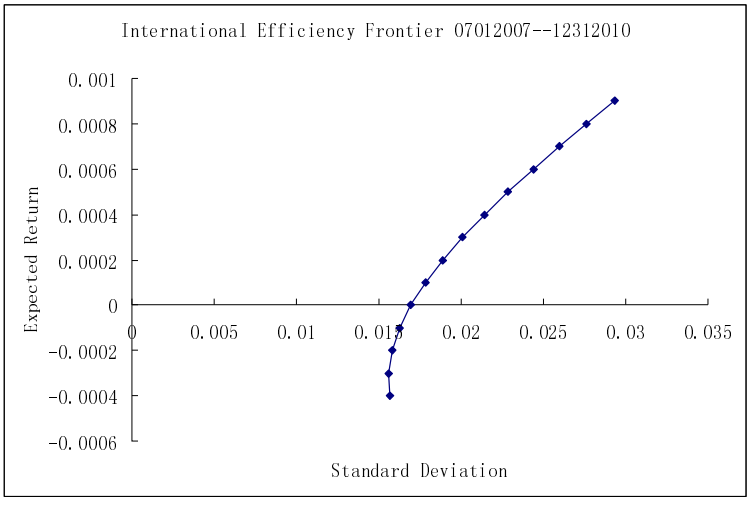

Fig. 1. International Stock Markets Efficiency Frontier during 07012007—12312010

Though it is strange that Chinese markets offered more attractive risk return trade off during Asian financial crisis, this is reasonable. If a market wants to survive the crisis successfully, it must have strength. During that crisis, international financial tycoons manipulated stock markets to make it drop substantially during a very short period and earned money by taking short position in that market earlier.

But they did not do this strategy in Chinese mainland stock markets. The Chinese government has very powerful financial strength and can maintain relative

high investment return (more attractive risk return trade off). This makes them impossible to fulfill the strategy in Chinese mainland markets.

But situation changed entirely in current crisis. China dropped its investment efficiency during the current crisis. The risk level increases substantially and by taking short position entirely in Shanghai market to achieve highest return level in practice. Two reasons account for this phenomenon. Economic structure adjustment in current China increases uncertainty during development; and there is not global "hot money" which wants to affect Chinese stock markets through shorting.

Currently, to invest in China and western countries together at the same time could help improve efficiency. Comparing table 4 with table 5, we find for the same expected return level, the risk level (standard deviation) for the international portfolio is lower than the risk level for Chinese markets portfolio during this crisis.

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English-Chinese Bilingual Lectures on Hydraulic and Pneumatic Transmission and Engineering Education

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Abstract. Hydraulic and pneumatic transmission technologies have play an important role in national economy and defense construction. They are the key to boost the performance of mechanical and electrical products and also to ensure the implement large engineering projects and huge heavy machinery and equipments. In China, there is an increasing demand for well-qualified professionals in hydraulic and pneumatic transmission. Taken Fujian Province as an example, two leading companies in this field, Xiamen XiaGong (XG) Machinery Co., Ltd and Lonking Machinery Co., Ltd recruit a large number of students with the background of hydraulic and pneumatic transmission every year. . In this paper, three means, including multimedia lectures, English-Chinese bilingual lectures and university-industry consortium, have been introduced in the course of "hydraulic and pneumatic transmission" at School of Mechanical Engineering and Automation, Fuzhou University, China. These effects are to attract more students to study hydraulic and pneumatic transmission and to service the related companies.

Keywords: Bilingual lectures, Hydraulic and pneumatic transmission, power system.

1 Introduction

The course "Hydraulic and pneumatic transmission" at School of Mechanical Engineering and Automation, Fuzhou University, China, is provincial excellent curriculum and also national bilingual exemplary course. Out teaching team have employed three means in this course to attract more students to hydraulic and pneumatic transmission areas and contribute to the competitive mechanical engineering area. First one is professors will introduce their research in hydraulic and pneumatic transmission to all students for every 90-minute lecture. All the students have to take the required course "Frontier of Hydraulic and pneumatic transmission". All the lectures are given by using the modern multimedia teaching techniques. The second one, bilingual lectures in English and Chinese has been taken in hydraulic and pneumatic system education to promote the internationalization of higher education. The third one, cooperation with industrial engineers are emphasized and a university-industry consortium is used to train the students in the final-year project. These are as the ways to attract good students to use the

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technology of hydraulic and pneumatic transmission into the competitive engineering mechanical areas.

2 Multimedia Lectures

The need to develop the capacity for autonomous and critical thinking in students and introduce practical approaches that complement the scientific background, have been acting as driving-forces that motivate engineering educators to develop new teaching methodologies[1] .

One of the most advantageous presentation aspects to autonomous and critical thinking for students is its support of various media. Highly technical course content can be much more interesting with the use of text, graphics, animation, audio and video, and can help the user grasp concepts not taught in traditional classroom settings [2].

The course 'Hydraulic and pneumatic transmission' in Fuzhou University adopted the multimedia method started from year 1995 to year 2001, and the related courseware was developed and published in year 2001. This course includes two parts with twelve chapters.

Part one: Hydraulic Transmission. Chapter 1, Introduction to Hydraulic and Pneumatic Transmission; Chapter 2, Fundamental Hydraulic Fluid Mechanics; Chapter 3, Hydraulic Pumps; Chapter 4, Hydraulic Actuators; Chapter 5, Hydraulic Control Valves; Chapter 6, Auxiliary Components for Hydraulic Systems; Chapter 7, Basic Hydraulic Circuits; Chapter 8, Examples of Hydraulic Systems; Chapter 9, Design of Hydraulic Transmission Systems.

Part two: Pneumatic Transmission. Chapter 10, Air Supply Devices and Pneumatic Components; Chapter 11, Basic Pneumatic Circuits and Their Application; Chapter 12, Examples of Pneumatics Transmission Systems.

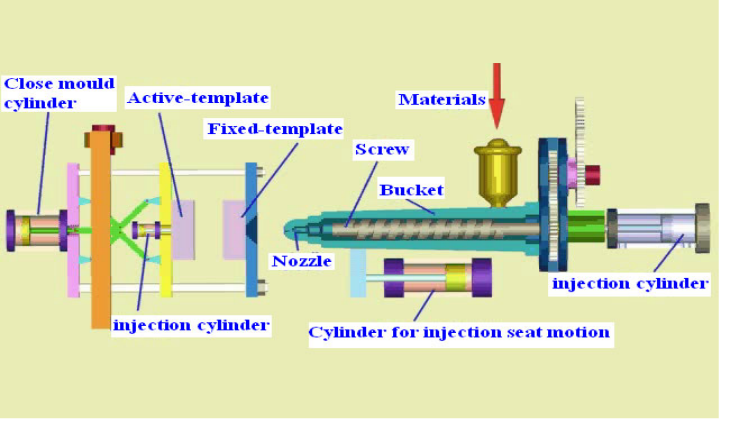

Fig. 1. Injection moulding

The multimedia teaching aims at leading students to obtain the basic knowledge: the operation principles, features, applications and the selection methods for kinds of components of hydraulic and pneumatic transmission system; to know well functions, buildup of hydraulic and pneumatic circuits and the application areas; to know the achievements of advanced hydraulic and pneumatic technology used in the mechanical industries and also the designs of the Hydraulic and pneumatic system. Examples for the multimedia teaching are shown in figures 1, 2, 3 and 4.

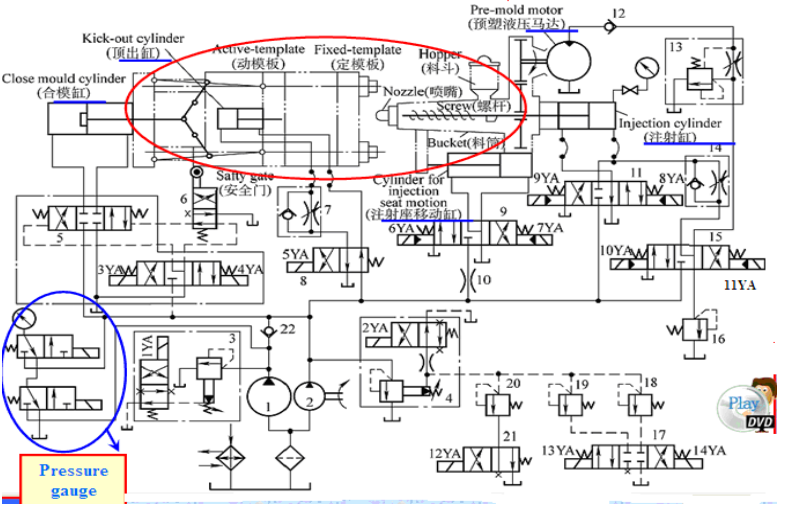

Fig. 2. The outline and hydraulic system of injection moulding.

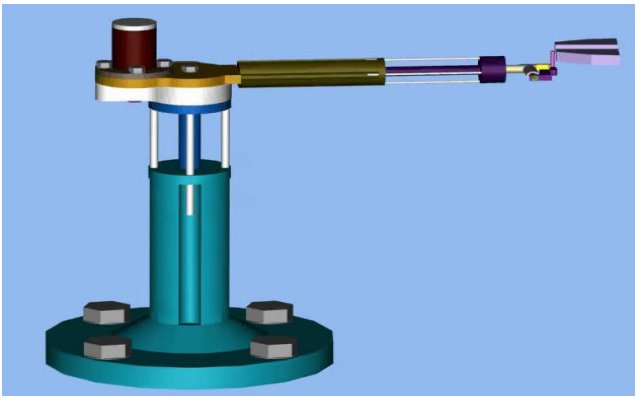

Fig. 3. Manipulator

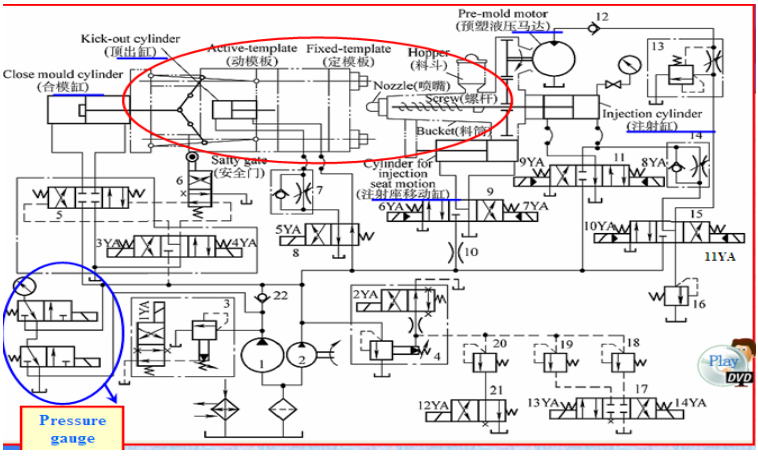

Fig. 4. Hydraulic system for industry manipulator

The first-version courseware 'Hydraulic transmission' published in Chinese in 2001 is used by both students and teachers. It realizes the teaching method transformation from 'writing on the blackboard and picture' to 'text, graphics, animation, audio and video' combination. For example, animation is also used to show how a reciprocating piston forces the liquid out of a closed cylinder system circuit. It arouses the curiosity of the students and attracts students to hydraulic and pneumatic transmission areas under the competitive engineering area.

3 Bilingual Lectures

The higher education in China is now entering a new era of reform which encourages bilingual teaching in foundation courses, technical foundation courses and specialist courses. The main objective of the reform is to promote the internationalization of higher education and to cultivate application oriented talents with creativity and quality education. Bilingual teaching is thus becoming one of the ways to link our higher education to the world facing various challenges of the new century and to assure high quality and comprehensive elitists. The reform in bilingual teaching is a strategic choice for our higher education in the twenty-first century. This book thus intends to provide a solid base for bilingual teaching and to meet the immediate needs of our higher education reform for interfacing with the world [3].

We have practiced the bilingual lectures, and also edited the bilingual textbook of 'hydraulic and pneumatic transmission' in English and Chinese since 2001 and get it published in 2008. It realizes the teaching method transformation from 'Multimedia lectures' to 'Multimedia and Bilingual lectures' farther.

This bilingual textbook exhibits following characteristics:

1. Bilingual. The bilingual edition represents the achievements of higher education reform in teaching and curriculum development for the 21st century. It emphasizes on the training of application oriented talents in the international context and quality education in basic engineering subjects.

2. Multimedia teaching. The accompanied CAI (Computer Aided Instruction) multimedia with case-based teaching materials, which animates and covers the complete contents of this book published simultaneously. Various-powerful software has been used to make the videos which demonstrate the dynamic, static and continuous actions. For example, pressure characteristics of hydraulic oil display clearly the oil flowing through the inner configuration of elements and system circuits, which represent clearly the principle of operating of elements and flowing dynamic experience for system circuits. Therefore the two main features: "pressure" and "motion" transmissions in hydraulic/pneumatic transmission system are represented visually. The large number of engineering models, animations, various function of multimedia, and intuitive presentation of live examples with visual virtual software effects were used to stimulate students studying interests, which will result in better efficacy.

3. English exercises. This book has been prepared to provide students and users with well-connected English-Chinese bilingual exercises. It will enable students to think and solve problems in the English context. It covers various simple and complex questions that are suited for a wide range of students and enables students to grip professional vocabulary, ensuring students of international application on the subject of hydraulic and pneumatic transmission.

4. Proving a re-edited CAI version. The electric CAI multimedia version prepared using power-point is an open course material with a large benefit that it could be easily modified (insert, cancel and revision) by teachers to meet the needs of their teaching.

4 Teaching Team in Cooperation with University-Industry Consortium

Laboratory and practice are very important for students in the education of hydraulic and pneumatic technology. And it usually requires a high expenditure on equipment purchase and maintenance. Virtual equipment that renders the equipment in a virtual world and provides an interactive interface for users can be an ideal solution to reduce costs. In this research, we focus on developing pump performance test-bed based on virtual instrument technique, as shown in figures 5 and 6.

We introduced achievement of research into teaching and built up 'two tutor system' with University-Industry, i.e., teaching team in cooperation with University-Industry Consortium. We set the final-year project for student based on the engineering project from industries, and tutor for the students by the 'two tutor system' teaching team. In additional, we have set the internet web help for the students to contact and exchange with scholars over the world.

Fig. 5. Pump performance tester

Fig. 6. Pump performance test-bed based on virtual instrument technique

5 Conclusions

Hydraulic and pneumatic transmission technologies have play an important role in national economy and defense construction, and also 'Hydraulic and pneumatic transmission' is one of the key technical foundation courses with wide application fields, such as mechanical design and manufacture, engineering machines and so on. This paper presents an idea how to practice the process teaching method from 'Multimedia lectures' to 'Multimedia and Bilingual lectures' and trend to the engineering education. Through practicing years, the lectures of our teaching team have got the honor of National Ministry of Education of China for 'bilingual demonstration lectures' in 2010.

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Evaluation and Analysis on Benefit of Chinese College Resources Input

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Abstract. From the 1990s, China's higher education has experienced a rapid development, which provides Talents guarantees for Chinese economic rise and the development of social undertakings. Colleges and universities as an important carrier of higher education, attract more investments from national financial departments at all levels, social organizations and students' families. The college education resource management increasingly becomes a hot social concern, arousing more and more scholars' research interests. Research indicates that the value of education input can be evaluated. In china, the higher education resources are infrequent, and the using efficiency can not be evaluated by analysis educational economic income of individual. This paper did a profound research on benefit of higher education from input angle based on the main components and clustering analysis method in multivariate statistics, using SPSS and R software. The result has prominent theoretical significance and practical value for high education resources management.

Keywords: Higher education, Resources input, Main components analysis, Clustering analysis, Evaluation.

1 Introduction

Development of higher education needs lots of input of a national and local and society's financial, human and material resources; meanwhile, the development of higher education provides a full range of integrated support for improvement of a country or localization. There are certain quantity relationship between the input and return. And this has been studied by American education economists Schultz and f. Danny sen. Schultz estimated education's contribution to economic growth in the United States, and analyzed education contribution to the national income growth in the 1930s to 1960s [1, 2]. From the 1990s, there is an enormous demand on education and all kinds of talents because of china's rapid economic development, this demand are more apparent in higher education. Therefore, China's higher education career obtained the rapid development in recent years; input of national and local higher education is more concentrated. the 10 years of 1999-2009 , our regular schools has grown 2.1 times and reached 2305, general specialized

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subject achieve growth of 576 3.7 times. In 2010 the central finance of college expenses reached 807.3 billion Yuan, but still doesn't meet the demand of the development funds. So it makes people to concern about usage and efficiency of college education resource. This paper aims to use multivariate statistical methods to analyze and evaluate the efficiency in the use of china college resources according to the higher education statistics.

2 College Education Resources Evaluation Index

So-called college education resource usage refers to the costs of higher education investment in monetary form, also the sum of college occupation and consumption of human, material and financial resources, including all the spending of countries, regions (department), social organizations and individuals for higher education. Colleges input benefit is analyzed and appraised on the school running effect, not only includes the funds, but also other forms of investment. Specifically, it can be used to evaluate colleges' usage efficiency of human, financial and material resources [3, 4].

2.1 Human Resources Investment Factors

In all colleges, the main human resource input is staff. All kinds of personnel play a different role. Therefore, cannot treat generally all staff equally and this will not evaluate the differences benefit of each person. Generally, college's staff is divided into three types: Senior scientific researcher. It referees to the teaching staff with senior and associate professor title. This is backbone strength of higher schools is engaged in teaching and research work, relatively speaking, has greater contribution to the development of higher education institutions. General scientific researcher.

2.2 Material Resources Input Factor

Material resources refers to the stock assets in higher colleges, it's with long-term use value. It can be divided into the following categories: Fields for teaching and scientific research. The college's output activities are just same to the enterprise; they must have the playground resources. The teaching and research field is one of the core assets in college, its size also illustrates the input strength of material resource for colleges. Other site area. Beyond teaching and scientific research field, it needs to provide necessary and normal operation fields for administrative, life venues, etc., and this also is an important part of material resource inputs. Teaching and scientific research equipment. These instruments and equipment are engaged in the teaching and scientific research activities, also the important component of college material resource input. Other fixed assets. The other fixed materials In addition to the above resources.

2.3 Financial Resources Input Factors

Similar to the working capital of enterprise, funds of directly used for of education, teaching and research each year is the main college financial resources input elements. The actual investment in research and infrastructure each year is considered as one of the important index for evaluating the university's level. The key index of effectiveness analysis and evaluation on higher education resources investment is shown in Table 1.

Table 1. Evaluation system index of high education resources utility

Investment Evaluation Index （X）	Human resource factor （X1）	X11	Senior research staff number
		X12	General researcher number
		X13	Else staff number
	Material resources Input factors （X2）	X21	S & R. Site area（M2）
		X22	Other site area（M2）
		X23	Value of equipment for S. &Res. （10 K RMB）
		X24	Other fixed assets（10 K RMB）
		X25	Books（10 K Volume）
	Current year Financial resources input factor （X3）	X31	Education（10 K RMB）
		X32	Science research（10 K RMB）
		X33	Infrastructure（10 K MB）

3 Verification Analysis

Primary index analysis and result. The principal component analysis is to simplify multivariable to less comprehensive variables, namely to reduce multi-dimensional variables. Dimension reduction of variables is original variables after the linear combination, and can represent the original variables, make the information loss of original variables loss least and comprehensive explanation strong [5]. This paper uses typical survey methods, selects 13 representative universities as the research object, and collects various relevant data in 2008, as shown in Table 2.

Using software SPSS the principal component analyzing techniques to extract the principal component college education resources, and discuss the significance of using principal component. Data processing results listed in table 3 and table 4. From analysis of main factor feature vector we can get:

First principal component: resource utility scale. It can be found that each resource use factors have positive role, and the weight of each element varies slightly. The second principal components: asset input elements. The role of annual infrastructure investment elements is great, therefore, assets investments elements is as the larger second principal components. The third main ingredients: scientific research input elements. It referees to the research investment, scientific research equipment, book resources and university research relevant inputs component.

Table 2. Statistics of 13 high education schools resources inputs in 2008

School NO.	X11	X12	X13	X21	X22	X23	X24	X25	X31	X32	X33
1	2623	2943	13578	338734	102439	894798	86204	872	131382	27862	30052
2	1274	1090	2845	245253	652648	20728	78343	473	42444	10537	7743
3	2098	2824	6903	503869	189788	572174	113438	649	106376	8470	43069
4	1365	1532	3749	261477	807931	64802	67407	630	69822	16287	10072
5	974	1341	2217	265845	559628	37089	27052	428	58878	11858	28142
6	2290	2781	4970	703582	118095	674085	127084	675	92638	30519	10087
7	878	899	1922	217680	418879	25419	29897	388	43872	6807	9236
8	1982	1613	5458	434678	948472	35381	67119	572	71011	7028	8834
9	644	528	1369	92416	257809	22406	16887	101	23176	5147	7167
10	1902	2431	5827	486872	144324	145725	82703	691	93472	10029	20147
11	1115	1250	3418	437178	865878	33870	132772	582	68262	15062	14386
12	1936	2872	4792	416989	115947	831569	80032	601	46318	10067	17113
13	579	1146	1965	136112	390839	15618	29886	379	20482	4308	13264

Data source: "China education yearbook", "Chinese education funds statistics yearbook", statistics of relevant college.

Clustering analysis and results. This paper uses R software to make data clustering analysis. R is an open programming environment, and one of a dialect of language of S, but also software. It is an integration of statistical analysis software that collects statistical analysis and graphic visual display. R was compiled by the Robert Gentleman and Ross Ihaka from statistical department of Auckland University in 1995. Currently, it is maintained by the core development team.

Table 3. Explanation of total mean square

Initial eigenvalue				Extraction squares & load		
Element	Sum	variance %	Accumulation %	Sum	Variance %	Accumulation %
1	7.751	70.460	70.460			
2	1.123	10.209	80.670			
3	1.025	9.321	89.991			
4	.410	3.724	93.714			
5	.265	2.408	96.122	7.751	70.460	70.460
6	.175	1.587	97.709	1.123	10.209	80.670
7	.119	1.083	98.793	1.025	9.321	89.991
8	.100	.906	99.698			
9	.020	.179	99.877			
10	.013	.117	99.994			
11	.001	.006	100.000			

4 Conclusion

The above research shows that the principal component analysis provides a way and framework for evaluating the utility efficiency of college education resources. College education resources can be modeled by setting the numerous indexes into the proposed mathematical model, then make relevant quantitative analysis. Clustering analysis can be a verification results as the main index analysis method. Analysis results show that the input-output of college education resources at present, overall is still in extensive growth stage, should do efforts change extensive growth gradually to the connotation, and to promote the further deepening development of China's higher education. In addition, likely sample more respondents for study to further improve the representative and reliability of research results.

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Investigation of the Connotation and Constitution Elements of Innovative Practice Ability

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Abstract. For practice behavior is a basic existence mode of human being, practice ability is the core ability of human existence, and innovative ability is the practice ability at higher level, innovative practice ability(IPA) becomes the basic objective of talent training in universities. Firstly, the connotation of IPA from two aspects has been analyzed in this paper. And then the constitution elements of IPA have been analyzed from four elements of innovative practice which are body and mind, profession, comprehension and motivation. The analyzed results show that IPA refers to not only enhancing the innovative features of practice ability, but also practice ability at higher developed level. And the four elements of IPA are interrelated and mutually promoted, and the different combinations will form IPA with different structures and levels. All these awareness become evidences for training the IPA.

Keywords: Innovative practice ability, Connotation, Constitution elements.

1 Introduction

It is practice that drives the social progress and economic development undoubtedly in human history, and the practice behavior is a basic existence mode of human being, practice ability becomes a core ability of human existence, so cultivating practice ability[1], especially IPA, has been usually highlighted in universities. IPA is the sign of innovative talent, and is the core of training innovative talent. It is also the basic objective of talent training in universities. But during the implementation process, phenomenon of one-sided understanding and the blind operating always exists due to the fuzzy cognition to the connotation and constitution elements of IPA. In this paper, the connotation of IPA has been analyzed.

2 The Connotation of IPA

IPA is to Strengthen the Innovative Features of Practice Ability. Practice ability is physiological and psychological characteristics which are necessary to ensure solving practical problems with the individual knowledge and skills. In other

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words, practice ability is physical and mental characteristics to explore the unknown knowledge with the known, and it is precisely the original meaning of innovation. So practice ability implies the innovative features. Practice ability is the sum of the individual physiological and psychological characteristics which controls the process and method of solving problems, and a complex and uniform system of mental and physical energy. To ensure the completion of the practical activities, monitoring and controlling system is needed for quality and level of practical tasks. This requires the initiative and active features for practice ability, which are the basic requirements for innovation emerging.

IPA is a Kind of Practice Ability at a Higher Level. The connotation of IPA focuses on practice ability. The word "innovation" is mainly to express the level of this ability, which is different to the general practice ability. The same objects can be practiced several times mechanically, or in different way every time. The former means that the individual may repeat or imitate others' practical activities to solve practical problems. The latter is the ability to solve practical problems cleverly and flexibly with unique, original, comprehensive methods in complex situations. IPA refers to the latter.

3 The Constitution Elements of IPA

IPA is the special ability to promote the individuals complete the practice. From the views of the practice, there must be driving force to carry out innovative practice, physical and mental basis to accomplish innovative practice, and professional foundation and comprehensive quality to achieve innovative practice. Therefore, IPA includes four elements.

Physical and Mental Element of Innovative Practice: Conventional IPA. Conventional IPA refers to the basic practice abilities for different professional undergraduates which are necessary to adapt to the current and the future professional, life and social activities. It has been shown as the independent living ability, the environmental adaptability, the association and cooperation ability, the language ability, the computer application ability and the foreign language ability[2], including five factors which are respectively the situated cognition, the knowledge construction, the information exchange, the communication and the body movement. These factors do not refer to how to solve the specific problems, and could not be lonely a link of the practice process, but could act as the physical and mental basis of practice process. The basic role of conventional IPA has been shown in three aspects. Firstly, the practical activities in different fields put forward different requirements emphasized on different main points to the individuals around the above five factors. According to the individuals and the fields in practice, the practice has been classified to the material production practice, the spiritual production practice, the knowledge production practice, the communion practice and the human itself production practice. The five practices must adopt the conventional IPA. Merely the knowledge construction is emphasized in the knowledge production practice, the interpersonal communication in the communication practice, and the body's movement in the sports. Secondly, the conventional IPA runs through all aspects in the practice process to solve some specific problem.

Relevant study shows that problem solving undergoes the problem characterization, the problem analysis, the solutions and the strategy selection, the strategy implementation and other links under the monitoring of the motivation and original cognition. Here, for example with only situation perception, in the process of the problem characteristics, to perceive the problem situation is need for the individuals, and then the problem space has been formed in the brain. When considering the causality between the problem elements, the individuals need collect experiences constantly from the perceived situations, and use the cognitive strategies to analyze the problems. Whether the problem solving manner adopts trying error or sudden enlightening relate to perceive the problem situation for a long time. In implementing process to solve problems, perception is the premise and the basis of the individual action. The monitoring and evaluation information of the individuals for practical activities are also from the perception for the entire practice process directly. Finally, the factors of conventional practice ability are independent each other. When one factor is immature or lost, other factors can't compensate directly. The immature conventional IPA will block and restrict practical activities directly. During the formation process of conventional IPA, the perception is the necessary precondition for the other four factors. However, the five factors will become more and more independent when the individuals are mature. The body's movement could not be improved by advancing the interpersonal communication level continuously. Meanwhile, the accuracy and sensation of the perception could not compensate for the defects which are impossible to construct knowledge for the individuals. The relative independent feature between the various factors of conventional IPA provides inspiration for training students' practice ability. That is to say, only the factors of conventional IPA have been fully developed, the practice level of the individuals could be really enhanced[3,4,5].

Professional Element of Innovative Practice: Professional IPA. Professional IPA refers to the necessary practice ability to fulfill some professional activity, including the special knowledge and the special skills[3,4]. The professional IPA is based on the integrated abstracting for a series of the same or similar specific practical activities. It is a physiological and psychological process with a certain uniqueness and procedure. Based on the development tendency of the individuals and the conventional IPA, professional IPA could be obtained by repeated training. The appropriate special skills have been necessary for the individuals to solve a large number of problems. Some practice is a special task for itself, such as fires fighting, repairing computers, using CT machine to get brain image, and so on. If the individuals have already had the corresponding factors of the professional practice ability, the steps to try errors will be eliminated during the process of the problem characterization, analysis, strategy selection and implementation process. The intermediate links such as the verification or the analysis have been reduced, in accordance with the procedural solution, thus the practical process could be speeded up. Some complex problems contain several special tasks in themselves. If the individuals are lack of the practical experiences or the corresponding professional IPA, the difficulties and confusions will increase in all links during practice process. And ultimately the practical activities may be forced to give up or the individuals are disoriented. Conversely, if the individuals have many professional skills related to the problems, they are free

from the disturbance of the irrelevant factors, and focus on the extraction and the processing of certain key factors. And the efficiency and the quality of practical activities will be increased at the same time. For the training targets of various specialties in different universities are different, the requirements of professional practice ability for students are also different. For example, the students of the engineering specialties are required to possess professional practice ability such as the drawing ability, experiment ability, ability to use equipment, process operation ability, mathematics operation ability and design ability. Nevertheless, it can be determined according to the basic idea--"analyzing the professional standards - determining the practice ability standard– decomposing the practice ability standard - determining the practice ability unit "[6].

Comprehensive Element of Innovative Practice: Comprehensive IPA. Comprehensive IPA refers to the practical ability required to complete complex tasks and solve new problems which often involve technical, economic, social, environmental and psychological problems. Not only conventional IPA, professional IPA and professional knowledge are comprehensively used, but the knowledge and the skills of different subjects and specialties, including matching analytical skills, planning skills, and execution skills. In the process of solving specific problems, the comprehensive IPA plays the most direct role, and its development level and the individual practice effectiveness are corresponding. The matching analysis in comprehensive IPA requires the individuals to assess their own ability, and diagnose the problem situation, then determine whether or not to practice. If the individuals have always faced practical tasks, and repeatedly analyzed the matching relationship between their own ability and the problem situation, then gradually he will recognize his ability exactly, and the involved innovative practical activities will have a great success probability on this basis. To solve the practical problems in specific situations needs the precise planning firstly, and then the solution schemes have been carried out smoothly. The each link of practical process has been exercised repeatedly during each problem-solving process, and various ability elements in IPA have been called fully. So the planning ability and the execution ability of the individuals may be exercised possibly. It is believed that the main difference between the individuals and the practiced objects is that during the practical activities, the practical ability of the individuals (people) is continuous to be increased, while the value of the practiced objects (materials) is continuous to be consumed. Solving practical problems in specific situations may improve the proficiency level and the efficiency of various aspects in practical activities, while promote other elements of IPA. The comprehensive IPA is not only the bridge and the link between the structure of IPA and the dynamic process of practice, but also the core to improve the level of IPA. In this sense, to enhance comprehensive IPA of the individuals, the efficiency and the quality in innovative practical activities in different fields are inevitable to be improved significantly. For example, the training focus of comprehensive training program opened to the rapid product development in machinery manufacturing engineering is the comprehensive application of the core technology of the rapid-developing product. It makes students complete a whole training process from the concept design to the actual production so that the students could have the practice opportunities such as

CAD/CAM, CNC, rapid prototyping, fast processing, and so on. The comprehensive IPA has many characteristics such as the comprehensive usage to multidisciplinary knowledge, the practice to solve practical problems, the creativity in some degree and so on.

Motivation Element of Innovative Practice: Innovative Practice Motivation. Innovative practice motivation includes the practical interest, the practical achievement and the practical pressure. The innovative practice motivation refers to the internal psychological process or the internal power to guide, stimulate and sustain the individuals to engage in the innovative practice by the practice target or the practiced objects. If the practical interest and practical achievement of the individuals are at higher developed level, innovative practice motivation is always strong. These powers for practice are not from external pressures, but from internal needs. Only the individuals tend to participate in the practice subjectively, conventional IPA, professional IPA and comprehensive IPA could be strengthened and improved gradually during practice. If the individual innovative practice motivation develops slowly, and the individuals always intend to evade the problems, then he will lose the opportunities to develop the various elements of IPA, and ultimately fail to solve the practical problems in the specific situation. In this sense, the innovative practice motivation should be an essential element of IPA. The innovative practice motivation is the motivity of the individuals to be engaged in some specific innovative practical activities. It promotes the cognition of the individual to innovative practical targets to transform from the outside incentive into the internal power, and thus initiate the individual practical activities. Appropriate innovative practice motivation help mobilize the individual initiative fully, and play a role for the maintenance and regulation to the specific activities in which the individuals are engaged. In general, if the individuals have a higher innovative practice motivation, facing specific problems, they have stronger innovative practice motivation correspondingly, and vice versa. If the motivation of the individuals to engage in some specific innovative practical activities in many fields is strong, it shows that the innovative practice motivation develops well. In the structure of IPA, the individual innovative practice motivation is necessary to develop and improve the overall level of practice. From the view of some specific practice, the individual innovative practice motivation is also a necessary premise to promote problems to be solved.

4 Summary

IPA refers to not only enhancing the innovative features of practice ability, but also practice ability at a higher developed level. IPA includes four elements which are respectively the physical and mental element, the professional element, the comprehensive element and the motivation element. Any element of IPA could be decomposed into some specific practice ability, and specific practice ability is composed of two corresponding components which are the knowledge and the skills. The four elements of IPA are interrelated and mutually promoted, and the different combinations will form IPA with different structures and levels. The conventional IPA is the foundation, mainly to solve the basic adaptation problems.

The professional IPA is the core, mainly to solve the problem of vocational adaptation. The comprehensive IPA is the key, to determine whether or not solve complex problems creatively. The innovative practice motivation is the necessary condition to develop and increase the overall level of the innovative practice.

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"1234 Project Design Curriculum Innovation Model" for Local Engineering Colleges on the Basis of "Excellence Plan"

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Abstract. This article explores the project design curriculum delivery model innovation that required local engineering colleges integrated use of several professional expertises on the purpose of cultivating field engineers, that is, innovative delivery model in CDIO's secondary-level project curriculum. This is focus and emphasis in education reform for those experimental colleges that implemented "Excellence Plan" or preceded engineering education under the instruction of CDIO ideology. The success of these courses delivery is related to the effectiveness of implementation of "Excellence Plan" or CDIO ideology and cultivation of reserve engineers. Ningbo University of Technology explored a "1234 Project Design Curriculum Innovation Model" during the practice of "Excellence Plan". The most notable feature is the combination of school and enterprise. Enterprises are deeply involved in all aspects of teaching process, such as project objectives development, project type selection, teaching preparation and implementation. By that, students are really feeling the superiority in cultivating students' engineering ability that brought by project education.

Keywords: Excellence Plan, Local Engineering Colleges, Project Design Curriculum, Innovative Model.

1 Background of Curriculum Design Reform

In 2010, Ministry of Education launched the "Excellence Engineer Training Plan". There were 61 universities entered that plan. Among them, there are two levels, one is ministry subordinate universities (985,211), and the others are local universities (the key universities and ordinary universities). The cultivation targets are divided into three categories: PhD as R & D engineers; Master as design and development engineers; Bachelor as field engineers. Ningbo Universities of Technology ranks as ordinary one in above 61 experimental universities, and its mail task is to explore the engineering education model of cultivating field engineer.

There are three characteristics in "Excellence Plan": Firstly, the depth of participation in cultivating process that enterprises get involved in; Secondly, universities cultivating engineering talents according to common standards and industry standards; Thirdly, to strengthen the students' ability of engineering and innovation.

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The core of "Excellence Plan" is to establish a mechanism that enterprises are deeply involved in college students cultivation process, including: universities and enterprises jointly design cultivating objectives, develop cultivating programs, joint implementing cultivating process, especially strengthen students' engineering ability and innovative ability based on cultivating objectives. This is the reform background that local engineering colleges explore the deep cooperation between universities and enterprises and causes for "1234 Project Design Curriculum Innovation Model".

2 The Current Status of Most Engineering Colleges in Project Design Curriculum

In engineering colleges, when starting professional courses teaching in many majors, generally, there are curriculums about project design. It's a compulsory way to help students better understand professional knowledge, train professional skills and cultivate professional qualities. Within four years, students are required to do a number of project designs, from small to large and in a gradually improving process.

Universities that implement engineering education according to advanced CDIO model usually classify projects into three categories: First level projects such as Introduction to Engineering and Graduation Essay require the use of all professional knowledge; Second level projects require using the knowledge of several related professional courses, such as certain circuit design, certain software design or certain architectural design, etc. Third level projects only rely on one certain professional course. All projects in above three categories have their own training methods. Many engineering universities are devoting great efforts to carry out a series of exploration and innovation. For example, a number of Ministry subordinate universities are exploring joint-teaching model, both at home and abroad; Universities with strong teaching resources are applying studio system, that is, students participate in project as a role of apprentice in teachers' studio. Universities with good cooperative relationship with enterprises, some of them, let students enter enterprises completely for the purpose of cultivation. It is so-called "3+1" model, that is 3 years studying n school, 1 year doing course design in enterprise.

Although experience created by these universities are dazzling, in terms of local engineering colleges, is difficult to promote. Because the reality of most of project's teaching in those colleges is only one teacher, one classroom, one subject, a large umber of students. For some colleges with comparatively better facilities, there are several laboratories can be used by students in project design. Carrying out teaching under such conditions, the effects can be imagined. That's why many graduates feel frustrated when facing real problems in workplace. Simply because they have never touched the actual project in school, no matter in the face of real engineering problems in workplace.

3 Local Engineering Colleges' Innovation in Project Design Curriculum Teaching Model

3.1 Project Design Curriculum Teaching Model

1+2+3+4 refers to one objective + two references + three integrations + four dual models.

4 Interpretation of Project Design Curriculum Teaching Model

One Objective——Lead the Direction of Project Design Teaching

- ***Meaning.***Treat cultivating industry-recognized reserve talents of "Excellence Engineers" as goal.
- ***Interpretation.*** This cultivating objective must be mutual-designed cultivating plan should be mutual-developed and its process should be mutual-implemented by both schools and enterprises. Only by that, objective can be reached.

Two References——Implement Teaching Ideology of Project Design Curriculum

- ***Meaning.*** Treat the demands of industry and employer as teaching reference, teaching and learning activities model is based on the theories of project, and deliver teaching model in a project-oriented way.
- ***Interpretation.*** This is a guiding principle that teachers design their teaching projects, choose their teaching methods, implement teaching process, and evaluate teaching effectiveness. It's compulsory to deeply understand employing requirements of enterprises and deeply analyze this subject's function, role and contribution in cultivating enterprise-recognized designer's overall knowledge, ability and quality. Then, according to that, design teaching project, choose teaching method, implement teaching process and evaluate teaching effectiveness.

Three Integrations——Implement Teaching Activity Plan and Preparation for Project Design Curriculum

Integration of Teaching Plans

- ***Meaning.*** Implement integrated teaching delivery plan of core theory courses and core practical courses.
- ***Interpretation.*** On the basis of One Object and Two References, teachers must understand the current implementation status and level of this course both at home and abroad before teaching, understand course's evolution process and its advanced teaching ideology. Meanwhile, according to school's positioning and educational concept and its own actual situation, set curriculum's teaching objective reasonably, develop curriculum's teaching plan comprehensively, design curriculum's teaching reform deliberately.

Integration of Curriculum Resources

- ***Meaning.*** Achieving integration by integrating teaching plans, teaching outlines, teaching materials, extensive reading materials, lesson plans, project descriptions, demonstration works and other forms of teaching resources through website.
- ***Interpretation.*** It's compulsory for teachers to complete preparation tasks before implement their teaching. Today's teaching requires teachers prepare their integrated teaching resources before courses delivery. It's already basic requirement for nowadays' teachers to show all mentioned-above teaching resources on website so that students can use them at any time.

Integration of Teaching Methods

- ***Meaning.*** The integration of teachers' teaching and the integration of students' learning.
- ***Interpretation.*** The biggest difference between project teaching and general teaching is it delivers teaching based on one or several "real" or "artificial" project. Teaching task is to make project implemented through teaching activities, then enable students to achieve relative knowledge, ability and quality for problem-solving. Therefore, during the process of project teaching, teachers must conduct integrated teaching design for knowledge-delivering, ability-cultivating and quality-developing.

Four Dual-Models——Implement Teaching Means and Methods of Project Design

Theory + Practice Dual Channels

- ***Meaning.*** Delivering core curriculum teaching through theoretical and practical two channels.
- ***Interpretation.*** Every engineering major has its own core curriculums that are crucial to cultivate students' professional ability, which are all related to their work after graduation. For these courses, theory teaching and practical project training are both needed. Therefore, that is a essential difference between college's engineering training and vocational institutes' skill training. In project design curriculum teaching, different design problems should be solved in different channels.

School + Enterprise Dual Tutors

- ***Meaning.*** Both in-campus teachers and off-campus instructors are provided in project design curriculum.
- ***Interpretation.*** For project design curriculum, both in-campus teachers and off-campus instructors should be provided. Because different functions lead to different focuses so that they have their own different strengths. In-campus teachers have long-term training in teaching arts, and off-campus instructors have abundant experience in engineering practice. Project design curriculum requires integrating their advantages to cultivate students.

Classroom + Industry Dual Classrooms

- ***Meaning.*** Both school's laboratories and enterprises are treated as teaching sites in project design curriculum.
- ***Interpretation.*** Project training need relative engineering condition and practice place. Both school's laboratories and enterprises are required to carry out project practice for colleges. Laboratories should be unconditionally open to students and off-campus practice sites should be used effectively to meet the specific process of industry's activities. Because many off-campus practice sites are in constant change and have restriction of time and space. Furthermore, direct or indirect costs occur. In this respect, school and enterprise should cooperate closely, facilitate mutual-convenience, create conditions for students' practice as much as possible.

Teacher + Student Dual Principal Parts

- ***Meaning.*** In project design curriculum, teachers as teaching principal part lead the smooth progress of teaching activities, and students as learning principal part participate actively in teaching activities and take initiative to complete various teaching tasks. Teaching and learning relay on each other, promote each other.
- ***Interpretation.*** Organizing project design curriculum' teaching activities is like a stage play rehearsal: Teachers play a role of script-writer and director. Students play a role of actor. Therefore, both of them are principal parts. They both should play consciousness and carry forward the initiative. For teachers' role, in addition to imparting knowledge, guiding ability and demonstrating quality, more importantly, do well in design and organization of teaching activities, control and evaluation of teaching process. Meanwhile, for students, they should learn in any way according to teachers' arrangement. This is the only way to play the functions of the project design curriculum and achieve its objectives.

5 Conclusions

Organization of project design curriculum teaching in local engineering colleges is the key link to cultivate students to grasp core knowledge, ability and quality needed for engineer. "1234 Project Design Curriculum Model", based on the "Excellence Plan", has its most significant characteristics on school & enterprise cooperation, that is, enterprise participate in every link, such as objective development, project selection, teaching preparation, and course delivery. Thus, its objective is in line with all stakeholders' common needs. Teaching concepts of relying on enterprises' recruitment requirement and relying on project teaching theory meet the needs of cultivating "Excellent engineer". Integrated curriculum plan, teaching resources and teaching methods have a reasonable, scientific, abundant system, and can meet the teaching requirement of 4 dual-model project design curriculum that can fully reflect best method of teaching delivery by school and enterprise. Therefore, "1234 Project Design Curriculum Model" can fully play

the advantages of school and enterprise, utilize expertise of in-campus and off-campus teachers, motivate teachers and students' teaching interest, achieve the goal of cultivating "Excellent engineer" reserve talents, make students really feel the superiority of project education in cultivating their engineering ability.

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Research on Practice Teaching of Engineering Education in Co-op Mode

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Abstract. Our engineering specialties students' feild time is often short. Students' practice ability is limited and the effect of inspection and absorption to the course content is not very well. Comparing with Co-op pattern in overseas universities, combining with our engineering practice teaching characteristics, it is more favourable to cultivate the realistic type engineering professionals who are adapted to society needs in Co-op mode. Analyze advantages of our engineering specialty practice teaching in Co-op mode and have summarized the specific implementation plan.

Keywords: Co–op mode, Practice teaching, Engieering specialty.

1 Introduction

"Co-op" is short for cooperative education program; it also can be called paid internship. Herman Schneider who is professor of engineering college in Cincinnati University founded it in 1906. Co-op is a kind of pragmatism teaching, the basic characteristic is combining theory with practice. In Co-op mode, the students take turns between learning and practice in academic years. In paid internships, students apply professional knowledge into work, and challenges and questions from work will promote students further study. Sophisticated Co-op mode is powerful guarantee to cultivate students' highly practice ability and high employment.

2 Analysis of Foreign University Co-op Mode

2.1 American

Course arrangement in the American university is not nervous like in domestic university. School work is finished mainly by the student independently. Course contents are also linked to social practice closely. In Co-op mode, students practice in the company, who can get valuable and professional experience. During getting an American university degree, the students have working experiences at least two years in the corporation. [1].

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For example, at present the scale of Cincinnati University Co-op course is the second largest in the United States, and there are 1200 enterprises to cooperate with Cincinnati University. Students can get $10,000 to $30,000 during paid internship in one and a half years. In Co-op mode, students practice six semesters in the company. There are special agencies in university to arrange practice for students. In order to be maked practice continuously, students are divided into two groups. A group study at school, another work in the enterprise and the two groups rotate every semester. In addition, there are some other colleges to provide paid internship, such as northeastern university, University of Pittsburgh, Marquette University, University of Dayton, Rochester Institute of Technology, Pace University, Clarkson University, etc.

2.2 Canada

Co-op courses which usually begin from the second semester are mainly opened by the Canadian public university. Meritorious students can apply for Co-op opportunity and pass the interview of the company. Meanwhile, the teacher who is responsible for Co-op course will provide guidance for students to search for internship units and interview [2].

For example, Waterloo University is one of the earliest schools in Canadian to introduce Co–op. Such as Computer College, the students learn and work, five years to complete education. The students learn eight months later start looking for work, two years later some students can get more than ten jobs and have stronger competitiveness. After the graduation, the students have a good chance to keep on working in the units where they used to practice.

2.3 British

Paid internships courses in British university, learning time is divided into two sections such as “study + work + study” mode. Generally speaking, Britain's bachelor's degree requires three years (except Scotland area), undergraduate courses require four years to complete in Co-op mode. At the beginning students study in school two years, and then practice in the third year, return to school last year. In master stage, graduate courses require two years to complete in Co-op mode, such as“study - paid internships - graduation project” pattern. In addition, there are some other colleges to provide paid internship, such as Brunel University, Sheffield Hallam University, Nottingham Trent University, Surrey University, the University of East Anglia, etc.

3 The Advantages of Engineering Practice Teaching in Co-op Mode

The topics of domestic engineering practice teaching often can't combine with practical application. So the topics can't fully embody comprehensiveness, practicality and advancement. Engineering specialties practice teaching gets more

hours, but the most are completed on the campus by students who are conducted by teacher. Even the students make feild operation; time is often short and without pay. Students' practice ability is limited and the effect of inspection and absorption to the course content is not very good. Because there are not long-term fixed internship units, so practice is lacked of comprehensive and consistency, the harvest is limited. According to the characteristics of engineering specialties practice teaching, it is more favourable to cultivate the realistic type engineering professionals who are adapted to society needs in Co-op mode [3]. In Co-op mode, the advantages of engineering practice teaching include these:

In Co-op mode, the Students can practice in relatively fixed unit. Such practice process is continuous. Along with the development of every practice stage, professional experience and depth increase. Make students understand deeper about operating process and professional characteristics, strengthen the joint between theory and practice, improve the students' ability to find problem , analyze and solve questions. It can get good practice effect.

In Co-op mode, students realize the practical use of the content they have learned in class and realize their own professional shortage clearly. When the students return to class, their interest and motivation of learning will increase. Students also know which course they still need to choose to adapte to the needs of the future work.

The organization which provides Co-op opportunity includes government, institutional organization, non-profit organization and private enterprise. Students practice in these professional organizations; their working time, environment, and task are comparable to the regular employee. The students can accumulate experience and create value for the enterprise, so they can get a salary. If behave well; the students would obtain a good chance to win a post in the internship units after graduation. Even the graduates are not employed by the internship units, this experience can make them easier to get good positions in other companies. In addition the company is easier to find the suitable employees..

There are other benefits, such as collecting money for tuition, contacting with professionals, improving interview skills, expanding cultural vision, etc

4 Engineering Practice Teaching Implementation in Co-op Mode

The domestic colleges should establish diversified teaching system, establish a standardized Co-op system, make the rules, and sign an agreement with internship units to ensure students' safety and benefit in practice. The special organization is responsible for contacting with practice units for students, the teachers who are responsible for Co-op course will provide guidance for students to search for internship units and interview, and ensure the students' rights and interests during the internship. The aim is to make students to get suitable internship position, ensure students to have enough experience and other aspects of quality before graduation, and gain specified income.

Settings of practice courses should keep professional theory frontier and combine professional knowledge with society need closely [4]. In the paid internships, professional teachers and internship unit's technicians will provide guidance to students. Professional teachers must supervise students' practice development, inspect the students' practice effect, require students to complete practice achievements and appraise them.

College can absorb cooperative units' personnel as teachers. Their main task is on behalf of the units to participate in the important decision and offer the proposals to teaching work. Meanwhile, the college can invite practical experience personnel in the society and famous professional teachers to direct teaching and scientific research and do project lecture [5].

The college and cooperative units can establish Research and Development Organization tolgether, where the students can work. Research results can be made use to promote the development of the units.

5 Conclusions

In Co-op mode, it is more favourable to cultivate the realistic type engineering professionals who are adapted to society needs, meet the social needs of engineering innovation talents, improve students' practical ability and creative ability, make students have stronger competitiveness.

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Creative Talents Training Pattern of Telecommunication Engineering in Colleges

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Abstract. National development obviously depend on the innovative talents, however, some present educational models and methods are against the process of professional training. In order to improve the situation, this paper discusses how to construct creative talents training pattern of telecommunication engineering benefit from the advanced undergraduate education experience in colleges and universities inland and abroad, gives the educational objective of creative talents of telecommunication engineering based on the request for personnel training at present, draws on a new set of telecommunication engineering personnel-training system combined with the demand for talent of the local industry economic, and elaborates how to stimulate the students' subjective initiative, form the creative thinking and realizing the sustainable development of personnel training through some reform measures.

Keywords: creative talents, telecommunication engineering, personnel training, innovation.

1 Introduction

With the advent of the knowledge economy times, creative ability has become the basic necessary quality for the qualified talents. As we known, the creative talents are the people who have innovation consciousness and creative thought, innovative practice and innovative personality. It is creative talents of telecommunication engineering who has not only individual development of resources capacity in all aspects, but also has apparent professional background and will become a talent soon[1]. Then they can make a great contribution to technology development and social progress out of school. Therefore, in order to adapt to the society requirement of professional in the new area, we begin with the fundamental point in the process of communication education, connect with practice, and enhance the students' application abilities and their creative abilities to explore a new set of telecommunication engineering personnel-training system.

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2 Scientific and Explicit Training Objective Is the Precondition of Cultivating Innovation Talents

Educational objectives are the specifications and standards of cultivation. It is a college's value proposition and specific requirements as to the question "what kind of talents a college is intended to cultivate", and it can also reflect a college's talent philosophy and embody a college's ideal and mission. In terms of organizational management, educational objectives are both the starting point and target of a college's talents cultivation. Thus, the quality of a college's education is up to the quality of its design of educational objectives.

The training of creative talents of communication is neither a wide technical subject education nor a narrow professional skill education. It is the training of application and complex talents who are the required in forefront of the production, engineering and operation and is the modern engineering technology education to ensure that the basic quality of the theory of talent-training. According to the requirement of the society, our training target is to foster the application-oriented talents who have the ability of practice and creative ability. It is different from research and development engineers who undertake theoretical research and system design, because it demands not only practitioners with solid theoretical foundation, systematic professional knowledge, but also demands they master experimental skills of hard technology, the ability of engineering practice, even potential quality. These works require that the universities provide good engineering environment and training environments.

Training program development of the cultivation of creative talents in communication engineering should tightly surround its own training objectives, pay attention to the succession, bring in appropriately and bold innovations to carry forward the strengths of the existing teaching model. Through the vertical and horizontal comparison, we should learn the merits of teaching mode abroad, study their teaching methods, formulate their scientific teaching plan, abandon old teaching methods, and then set up a new training style gradually. To put it simply, an innovative student of communication major should have an ability to think, express and write logically, think and work independently, and be creative. In my opinion, colleges should also update the education philosophy. A college is a place that fostering students' innovation, rather than a base of exporting highly educated workforce.

3 Teaching Methods of Advancing with the Times Are the Key to Cultivate Innovation Talents

The concept of institutional operation of innovative education should have the property application branch of learning: focus on 'good foundation and stressing application'; teach mature technology precisely and stress in the foundation of emerging technology, take practice as clues throughout the teaching process, set up the new curriculum teaching system which through training to promote the theory. The teaching system is not only about the provisions of learning for

students, but also the requirements of teaching for teachers. The design of a teaching system should embody two aims: be beneficial for students' all-round development and individual development; guarantee teaching quality and facilitate quality of talents cultivation[2,5].

Great works of education, quality comes first. Advanced conception of teaching is a firm protection to improve the quality of teaching. The teaching conception of communication engineering should have the bright time feeling with teaching practice as the main one, keep pace with times correspond to social needs, be brave in making innovations, effectively improve the major quality as well as the students' market competitiveness. In the specific teaching process, we can adopt the following teaching methods:

The first one is case teaching. Case teaching is a interactive process that student to teacher and student to student, through the manner that using discussion to solve problems and give full play to think and practice activeness of students. In specific, nurturing innovation can be obtained in seminars, in which teachers and students are equal and exchange ideas with an open mind in a more relaxing environment. Seminars contribute to the cultivation of students' activity, initiative, a critical mind and creativity.

The second one is open teaching. Open teaching is based on limited classroom teaching and gives students enough time and space to play their imagination and solve practical problem. Thus, it can enable students to assimilate and absorb better and at the same time, cultivates students' creative ability.

The third one is to highlight people oriented, emphasize students' individuation development. For students, they come from every quarter and their individual conditions are not quite similar. We should pay attention to students' emotional experience in the academic program, know every student's strong suit, teach students according to their aptitude, on the required basis of specialty education, and make a set of unique learning plan which matches them and enables them to learn and practice [2,3].

4 Scientifically Sound Curriculum System Is Guarantee to Cultivate Innovation Talents

As is well known, education requirement of four years is much higher in technological university, which embodies in the integrity and rather deep level of speculative knowledge system and requires firmer foundation of the mathematical subject. Especially for communication engineering, it involves wide knowledge and mathematical foundation, as well as great deal of experiments and engineering train. At present, the development tendency of teaching reform is compressing credit hours, to give students plenty time to train and improve self-competence. Under such a condition that credit hours is limited, how to cultivate orientated toward the 21st century innovation talents meet the demand of national economic development is the final purpose of educational reform, which need to set up a scientifically sound professional curriculum system to protect. At the beginning of the establishment of communication engineering, our shool starts to carry out the

construction of course system and teaching reform. According to the realistic situation of communication in our school, the need of teaching reform projects which the seminar undertook and the need of new situation of construction of curricular system, we proposed the "platform & module" curricular teaching reform method.

"Platform & module" teaching model makes a plan for the four-year teaching plans of telecommunication engineering, students complete to construct "platform" from 1st to 4th semester. The so-called "platform" refers to public courses such as Advanced Mathematics, Linear Algebra, College Physics, Probability Theory, Complex Function, as well as major basic course such as Basic Circuits, Technetronic, Signals and Systems. For basic public classes, according to the "good foundation" requirements of major, we make a reasonable arrangements within the required credit hours and do "enough, useful". For specialized core courses, we make rational reorganization and scientific distribution reform to the content of courses, delete repeated and outdated content. According to the requirement of "wide knowledge", we properly conduct the interplay among the relevant specialty, reduce the theoretical teaching, and strengthen the cultivation of operating ability.

The so-called "modules" means that in the process of teaching professional courses of telecommunication engineering, we should carry out the cultivation of split-phase professional emphasis, set up major courses, highlight pertinence and applicability of the curriculum, and strengthen the cultivation of students' practice. In our school, telecommunication engineering can be divided into three directions: communications technology, signal processing, and electronics technology. At the third year of study, students can choose fit direction according to their actual situation. In order to strengthen students' practice skills and engineered capacity, according to the requirements of training creative talents, we strengthen practice training at each "module", providing practical training such as engineering training, integrated design and technology and provide conditions for the cultivation of students innovation ability from both software and hardware through all kinds of competitive design, such as the construction of open lab, electronic design contest, and etc.

Colleges should attach importance to the role of general courses, and encourage students to take music and art as an elective course, thus to promote their humanistic quality and cultivate their tastes. The other benefit of that is to cultivate students' image thinking through the balance of science and art, which will facilitate scientific innovation.

5 Rational Structure of Academic Team Are the Foundation of the Cultivation of Innovation Talents

The most central critical aspect in professional building is the academic team construction, which is very important especially for the cultivation of innovative talents. Innovation education lies in practice teaching, which makes higher requirements of theory and practice to teachers. In the process of building academic

teams, we should take full advantage of the advantages that the good old teachers' rich practical experience and young teachers are able to acquire new knowledge rapidly, do a good job in the combination of the old, middle-aged, young teachers[4].With the expansion and an increasing in the number of students of colleges and universities, we also need to expand the teachers' team further, especially the team engaged in the practice of teaching. So we have to do well in the following aspects:

First, deepening the reform of the personnel system. We should bring in the talents having the sense of innovation and creativity in a flexible manner in this engineering. For instance, we may employ a number of research institutes and the experts in telecommunication enterprise who are able to play a important role in this subject. On one hand, we may integrate with the market, keep abreast of the development of the subject and meet the market demand, which is good for the cultivation of innovative talents. On the other hand, this may also conducive to cooperation between schools and enterprises and improve the teachers' research capability and the school's reputation.

Second, providing teachers with opportunities of further education and training to improve their quality. The training of talents with creative mind is a special process of personalized features, thus, it is a must for teachers to learn to mobilize students' individual learning initiative ability. In a sense, development is an incentive for teachers. Therefore, it is wiser for colleges to start from the teachers' professional development, innovate teacher training system, encourage through development, develop by incentives, and thus establish a win-win situation.

6 'Industry, Academia and Research Integration' Is a Platform to Cultivate Innovation Talents

If we want to develop teaching, we must enhance scientific research level that is the key point. To cultivate high standard of innovative communications technology talents, capacity of scientific research of teachers is the key point. No high-level scientific research, there will be no academic development, no attraction of undergraduates, and no high-quality undergraduate. Without high-level scientific research, the level of the teachers can't be improved, and there will be no high-level teaching. No "innovative research", there will be no "innovative teaching", it is impossible to cultivate "innovative talents" .The cultivation of innovation talents, must with powerful scientific research force in the backgrounds, scientific research is a stage where can academic knowledge, and students can participate in teachers' research projects to examine their professional knowledge and innovation ability, thereby enhancing the individual's practical ability, mastering scientific learning method, thinking processes and research approach. Teachers can master burgeoning technology of disciplines through scientific research, to penetrate into teaching, improve their teaching level.

Meanwhile, colleges can take an initiative to cooperate with large enterprises and establish practical training bases. In this way, on one hand, colleges can make up for the situation of insufficient practice teaching and ensure the set practice

teaching place and stable teaching quality, and students can have an early understanding of the requirements of future job, work procedure, ect., thus lay a good foundation for it. On the other hand, it is beneficial for the cooperate unit which can select the excellent students and train them as potential employees[3,5]. Therefore, establishing practical training bases is a double-win practice for both the colleges and enterprises.

7 Conclusions

Actively exploring innovation talents-training pattern in telecommunication engineering in high school is a long-term and complex systems engineering, which should not be took place overnight. So we must continue to deepen teaching reform, strengthen the construction of teachers and perfect the teaching system, set cultivate more qualified innovation talents as large goal that we need to pursuit untiringly, which is the historic responsibility of colleges and universities.

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Research on the Performance Incentive Methods of Higher Education

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Abstract. The performance incentive methods of college teaching include target incentives, treatment incentives, material incentives, spirit incentives and democratic management incentives. These methods must be integrated alternatively and take the appropriate degree in order to be artistic, concrete and feasible, and unite perfectly the overall development of school performance and the individual teacher performance.

Keywords: Teacher, Teaching performance incentive, Method.

1 Introduction

In colleges and universities, incentives have come to be an important function of school management and are also the best way to mobilize the enthusiasm of faculty and staff for work. How to motivate faculty and staff, what measures taken to explore the potential and enthusiasm of them, appropriate incentives to mobilize teachers' teaching and research performance and motivation, which is the teaching management, maintaining unity and cohesion of schools to achieve school long-term development objectives and overall performance.

2 Target Incentives Method

Target Incentive Method (TIM) is from Management by Objects (MBO), it formed a set of management system based on Scientific Management and Behavioral Science. With this system, members can organize themselves to participate in the formulation of objectives to achieve "self-control", and efforts to complete the work objectives. As for the results of the work of employees, due to the clear goal as assessment criteria, the evaluation and reward of employees to achieve become more objective and reasonable, and thus can greatly stimulate the staff to achieve organizational goals.

It can be generally divided into the following four steps about Target Incentives Method used to improve teaching performance:

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Establish a Complete Target System. To implement MBO, the first step of school is to establish a complete target system. The work is always started from the highest authorities of the school, and then top-down level by level targeting. The relationship between the upper and lower levels of the target is usually a "purpose - means"; a level goals need some means to achieve, and those means become the next-level sub-goals, pushed down by level along until the operational objectives of operating level, which constitutes the target of a chain-type system.

Considerate the Division of Responsibilities and Achieve Target Agreements. It is needed that re-examine the current organizational structure after target, and adjust the structure according to the requirements of the new target decomposition to clear objectives and coordination between those responsible. After enactment of personal goals, teachers write them in a written agreement, propagate the target record card, and arrogate all the information across the organization to draw the target figure.

Organize Implementation. With Objectives established, Managers should delegate powers to lower—level numbers, and focus on integrated management grab. Completing those goals depends mainly on the self-control of implementation. In the clear objectives, the management of higher levels should be mainly in the guidance, assistance, asking questions, providing information and creating good working environment.

Inspect and Evaluate. About the completion of objectives at all levels, manager should make deadline in the plans, check regularly whose method can be flexible, such as self-inspection, mutual inspection, and checked by special department. The checking is based on pre-determined objectives. The result should be evaluated based on objective, and reward and punish them based on the evaluation results. After evaluation, it goes to the next round of MBO.

With such a target incentive management process, it can set effective performance goals for every faculty and staff, make the strategic position of the school as one with people, in order to form a system of management by objectives to achieve top-down teaching goal decomposition and bottom-up performance summary, in order to achieve the school's overall development objectives and overall performance.

3 Treatment Incentives Method

According to the theory of stimulation, the treatment in foreign countries is generally "health factors", but in China it is also a "motivating factor" in the ingredients. Favorable treatments could protect or maintain normal play of working enthusiasm and poor treatments could cause discontent which dampens people's enthusiasm for work. Generally, treatment system in university is composed by wages, benefits and working conditions.

Reasonable "Salary" Is the Basic Form to Protect Teacher Enthusiasm. Because wage is an important method to meet the needs of teachers' lives, teachers will not only feel secure life, but also feel that it is a symbol of their social status, role play and personal achievement.

Generally, a reasonable salary could raise teachers' satisfaction and protect their enthusiasm. So school managers should establish a reasonable system of labor wages according to the principles of "merit-linked" and "Reward hard-working and punish lazy". The system is better to regard wage, raises, wage system and structure, bonuses and pensions as a system being understood by all staff.

Variety of "Welfare" Is an Important Prerequisite for Teachers to Work Hard. The welfare of colleges and universities generally includes public welfare, personal welfare, life welfare and paid holidays. Public welfare is something ruled by law. It mainly includes the followings: medical insurance, pension insurance, disability insurance and unemployment insurance. Personal welfare is selective according the needs of school development and teachers' development. It mainly includes the followings: housing allowance, provident fund, pension, termination payments, car stickers and rice paste. Life welfare is other types of welfare programs provided for teachers' lives. It mainly includes the followings: legal and psychological counseling, teachers' single apartment, nursery, nursing home, daily necessities and internal discount goods. Paid holiday is a kind of program which teachers could be paid without work in the holiday. It mainly includes the followings: winter and summer vacations, statutory holidays, sick leave, personal leave, and marriage.

Favorable "Working Conditions" for Teachers Creates an Effective Guarantee for Success. So far, the majority working conditions of university teachers in general is not perfect. Many universities only provide some simple office supplies (such as office furniture), and almost have no other decent facilities. This extremely primitive working condition for teachers will cause work dissatisfaction and weaken the enthusiasm of teachers.

Therefore, school managers should try their best to create a good working condition and environment, improve working conditions of the office, teaching and scientific research, do seriously a good job of logistical support, provide places for various activities, and further improve the autonomy of teachers. Then teachers would wok in their own effective ways and complete their teaching and research tasks assigned by school.

4 Material Incentives Method

Material reward is a reward to the people who do the excess works or excellent performance, supporting the target behavior. Typically, the material reward is a "motivating factor" in the "two-factor theory", which is to meet the needs and mobilize people to work and one important means of motivation. Therefore, the leaders of university should give the well-performing teachers praise and honor to incant them by spirit, also should give timely a certain number of bonuses, prizes and incentives, more wages by substances in order to meet their needs to mobilize

their positive emotions and enthusiasm. This can encourage the advanced and power the latecomers.

Incentives materially to teachers usually have some kinds, such as bonuses, prize, raises and some other things. Bonuses generally can be divided into the average award, performance awards, job awards, reasonable suggestions award, super workload award, extraordinary contributions award, etc; prizes typically include houses, cars, household appliances, stationery, free services and free travel, and other valuable prizes. Raises generally include regular raises and irregular raises.

To play the greatest role of incentives, the following points must be taken: awards must be implemented when teachers completed the target behavior; we should find out the result is positive or negative implementing the awards; to award master degrees mainly refers that the number of reward should be appropriate, not too much; In addition, the school leaders at all levels must understand and distinguish the performance of each teacher, to give different people different evaluation and material rewards. Unjust and unfair assessment of incentives will hit the morale of teachers; reduce the credibility of the leadership. As school leaders, they must always maintain their own credibility and authority; otherwise, a variety of evaluation will be dismissive of the teacher and lose the influence.

5 Spirit Incentives Method

People's behavior can be driven not only by material interests, but also by spirit factors, especially for the first-line teachers.

Spirit incentive that is intrinsic motivation refers to the invisible spiritual motivation. It includes authorized staff, the recognition on performance of their work, fairness and open promotion system, providing learning and development opportunities to further enhance themselves, flexible system of working hours and developing career development which are comfortable for everyone's features.

Spirit incentives can bring about the surrounding performance. It can enhance the teachers' initiative, communication and coordination awareness in service, personal development will and organizational discipline, to do voluntarily some work that is not part of the tasks assigned, be able to show necessarily additional enthusiasm or to make an extra effort to complete the task assigned successfully; help others and work with others; follow rules and procedures of the organization when feel inconvenience, agree and support organizational goals.

School managers inspired the spirit of teachers from the following aspects:

Praise and Recognize Teachers about Their Merits. Recognize their strengths to commend teachers - teachers have self-confidence because of commendation – because of self-confidence, they will comply and make some progress even if blamed, - because of progress, he has more chance of being praised, thus forming a virtuous cycle.

Accomplished Teachers Should Be Awarded With Various Honors. University administrators praise those people who have made outstanding contributions to

teaching and research. The way of praise should be fixed with awards, medals and honorary certificates and be implemented through the annual awards ceremony.

The Proponents Need to Be Paid More Praise and Encouragement. Typically, those with a strong sense of responsibility and team spirit will make recommendations or comments to the leadership. School administrators should give high recommendations and recognitions to the teachers and praise their creation and sense of ownership for the development.

Make Criticism and Punishment Play the Role of Incentives. Incentive requires both praise and criticized. Incentives can be both positive and negative. The methods of material incentives and moral encouragement are positive and the punishment and criticism are negative. The managers should pay attention to followings when criticizing: be with reasonable and mental reason; not hurt other people's self-esteem; use different methods to different people.

In general, punishment is a way for community or organization to prevent people from bad behavior and the occurrence of gross negligence. Punishment is also a warning and education to the other people, to tell them what can't be done, in order to prevent the occurrence of behavior that people do not expect.

For colleges and universities, the punishments to teachers are mainly the followings: withholding of wages and bonuses; dismissal, demotion and termination; cancelling promotion qualification; cancelling some welfare; disciplinary action.

6 Democratic Participation in the Management Incentives Method

Democratic participation in the management is a management mode like this: teachers in schools participate in decision-making work to play their ability, so that the teachers and organization grow together. Its inherent ideological basis is through the impact of faculty and staff participation in decision-making, enhance their autonomy and control of work and life. Thus, teachers will have higher enthusiasm and be more satisfied with their work, be more loyal to the organization, so that the level of performance will be improved accordingly.

Generally, the school manager can adopt following methods to let teachers participate in democratic management: according to the "Education Law", the school should have the Representative Assembly of Faculty and Staff decide something that should be done by them, so that the representative faculty and staff can supervise the hiring, firing, benefits, training and other related aspects of the vital interests, participate in decision-making; in order to let the teachers have the right to share the proceeds of the achievements and honors, sharing the difficulties of the school; do democratic dialogue, convene regularly the Representative Assembly of Faculty and Staff, so that the majority of teachers can participate in making school development plan, educational ideas, the wage scheme, bonus distribution programs, welfare programs, and some other decision-making, to really complement the democratic decision-making and participative management.

7 Summary

In short, the performance incentive methods of college teaching can be varied, but the goal is the same. Meanwhile these methods must be integrated alternatively and take the appropriate degree in order to be artistic, concrete and feasible and achieve the perfect unity of the overall development of school performance and the individual teacher performance.

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Study on Innovative Training System in Local University Based on TRIZ Theory

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Abstract. Innovative education in local university faced some of complicated problems, TRIZ theory is introduced to solve these problems, and the innovative talents training system of local universities is established based above results. Through the integration of external conditions, internal conditions, combined with internal and external conditions, creative talents training is realized. internal conditions is key factor, pay attention to train students' ethics, knowledge, abilities, thought, physic. the TRIZ theory is made as a course, which guids students to master the tools, to facilitate students to practice using the TRIZ innovation theory, to enhance the students innovate ability. This scheme provides a reference for the construction of innovative talents training system in local university.

Keywords: innovative talents training, local university, TRIZ theory.

1 Introduction

Universities are an important places in training innovative talents, some famous universities pay attention to the innovative talents training. American colleges and universities take a student-centered educational philosophy, and train a large number of innovative talents. French universities adhere to the educational philosophy of "national service", emphasis on integration of theory and practice, take "multifaceted" and "multidisciplinary" as the characteristics. Japan colleges attaches mainly to the creative personnel training, especially students' creative thinking training and creative express. Germany uses the "dual system"model of unversies and businesses to train innovative talents [1]. Training for innovation also conducted research and practice in China, He Yan writes a book of "Introduction to Creative Talents" to describe the individuality of creative talents, growth and development, development of creative talents and so on. Colleges also committed to research and training of "innovative graduates ", but have a distance to close that of foreign countries in training philosophy, teaching methods, curriculum and the others[2].

In this paper, local universities are taken as the research object, the TRIZ theory [3-5] is introduced into solving the conflict in the training of creative personnel, and according to the soluation results, local university innovative training system is built, to provide reference solutions for enhancing the quality of education in local colleges.

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2 Contradictions in Local University Innovative Talents Training and TRIZ Solving

Local university innovative education faces some contradictions, such as conflicts of traditional culture and innovative culture, the contradictions of procedural training mode and freedom innovative thinking of students, the conflict of teachers' traditional knowledge systems and teaching mode, innovative teaching requirements, the conflict of unified standardization of educational evaluation, and the real-time, innovation process evaluation, and so on. Usually, these contradictions are weakened by compromise, but not conducive to the development of innovative education, and sometimes cause conflicts intensified. TRIZ theory used to solve these contradictions, can really eliminate conflicts, to obtain the ideal solution.

Innovative talents training system involves two levels, one is for ethics of individual talents, knowledge, thinking, ability and physical qualities, and the second is Coordination mechanisms and support each other among the school, society, government. These connect each other, and also conflict, when conflict, depending on the type of conflict, to seek the appropriate solution method from the TRIZ theory tools, to obtain the ideal solution.

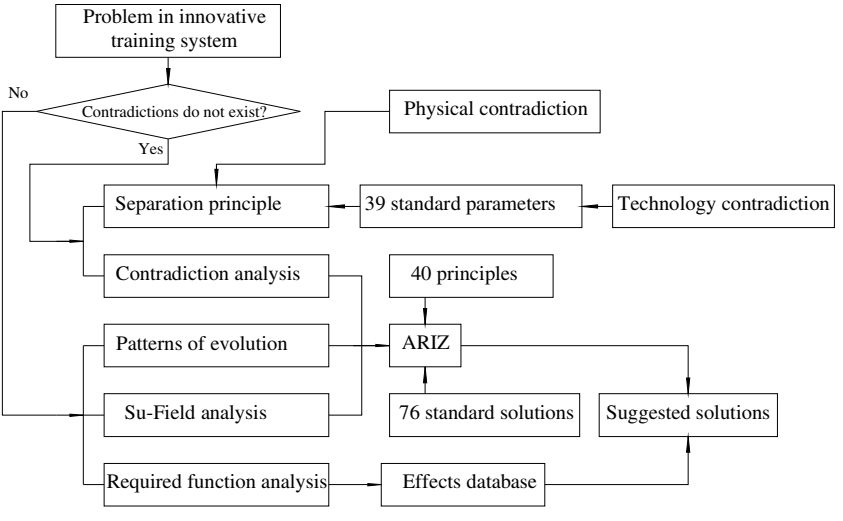


Fig. 1. TRIZ solving model of local university innovative talents training problems

For the problems in local university innovative talents training, the soluation sheme by using of TRIZ theory is shown in Figure 1, the first type of problems is analyzed, if there is a conflict, distinguish the type of conflict, if it is the physical conflict, separation principle is used to solve, if it is a technical contradiction, the conflict is discribed by standard parameters, to distinguish the parameters for

improvement and worsening parameters, to find the corresponding inventive principles from the contradiction matrix, to obtain the ideal solution through the detailed analysis of the principle of the invention; if there is no conflict, to obtain the ideal solution through phylogenetic analysis, substance- field analysis, scientific effects database. Through this process of analysis, a variety of solutions of innovative talents training problems are obtained, and a reference for the smooth implementation of innovation talents training scheme is provided.

3 Establish of Local University Innovative Talents Training System

The local university innovative talents training system is established as shown in Figure 2, through using TRIZ theory to solve the problems existed in innovative talents training.

The system includes the external conditions, internal conditions, the interaction of external conditions and internal conditions. External conditions are divided into local government, social environment, business factors; internal conditions include students, teachers, curriculum and management; the interaction between internal and external condiction is: research, teaching, social services. To students, need improve their ethics, knowledge, abilities, thought, physical (good health), and also evaluate and improve their innovative ability. To teachers, need enhance their efforts of updating the knowledge, and evaluate and improve their innovative teaching ability. To course and management, mainly need optimize the curriculum, open teaching and self-management. To teaching, mainly using open CDIO teaching mode, the virtual practice system to solve the conflict between limited teaching hours and boundless enthusiasm of students, CDIO teaching mode emphasizes the close integration of practice and theory, to study theory in practice, by setting the appropriate driven project, and configure the corresponding theoretical knowledge point, made students with practice while studying, these measures could improve learning results, and encourage teamwork and inquire learning, enhences their team spirit and practical capability [6-8].

The external conditions have the long-range effects to innovative talents training through social and cultural, also directly impact that by the three major functions of the university: research, teaching, social services so that need attend to communicate external conditions, to obtain their support. The internal conditions play a decisive role in innovative talents training system, it mainly focus on training students' ethics, knowledge, abilities, thought, physical, to update the knowledge of teachers and students, to solve the complex problems encountered in the teaching process by using TRIZ theory, to make students master the TRIZ

theory tools (the TRIZ theory acted as course, building teaching mode based on project-driven, to help students quickly grasp the TRIZ theory), to establish the innovation case database based on TRIZ theory, which provides the reference to teachers and students with innovative sample.

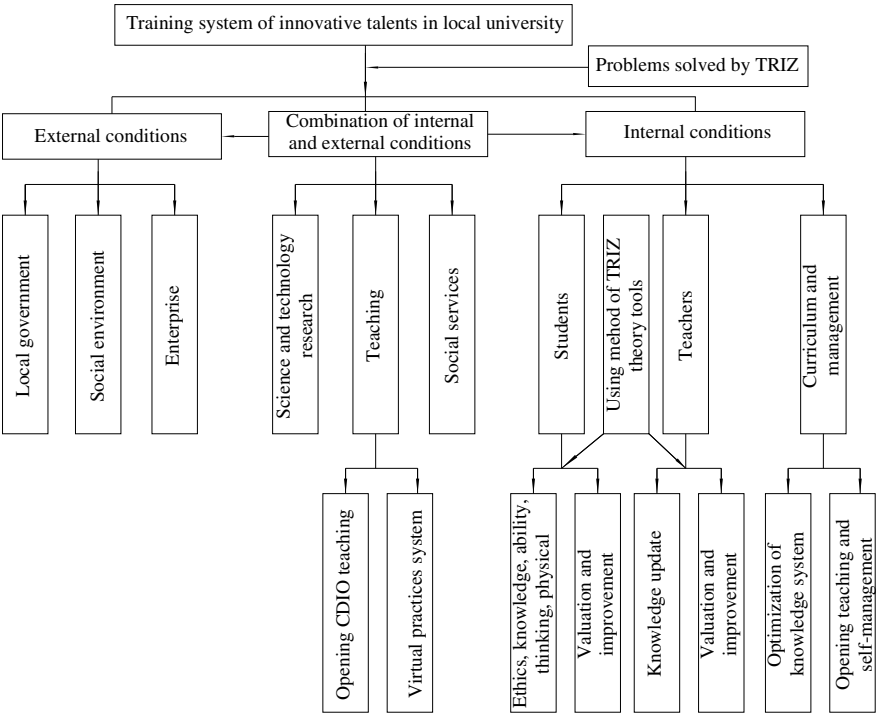


Fig. 2. Training system of innovative talents in local university

4 The Results of Teaching Practice

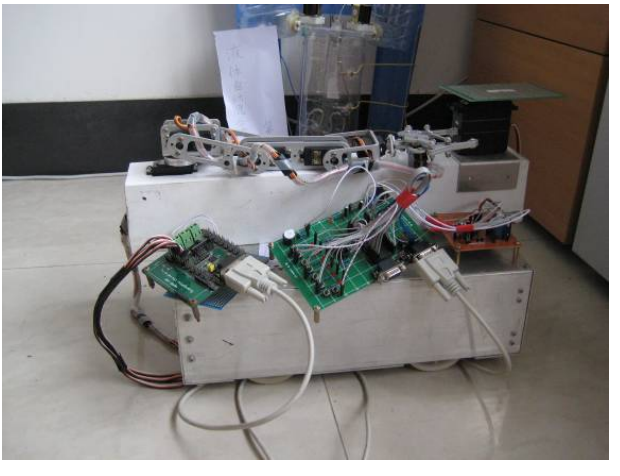
In innovative education, the design of CDIO class is: after-class practice, discussion of the results, theoretical inductive explanations, topics in-depth discussion, teaching schedule and after-class driver projects is given to students in advance, students independent complete the after-class projects, practical results discuss, topics in-depth discussion, teachers finish the theory of inductive explanation. The learning effects are great, there are lots of student' achievement, their innovative capability is improved. Figure 3 shows the learning process and learning results.

(a) discussion

(b) practice in enterprise

Fig. 3. The learning process and learning results of students

(c) taking part in competition



(d) product

Fig. 3. (*continued*)

5 Conclusions

In this paper, the TRIZ theory is introduced into local university innovatve talents training, helping them to solve complex problems, establishing a TRIZ innovative problem solving model, and constructing training system of innovative talents in local university. It is improved through the integration of external conditions, internal conditions, combined with internal and external conditions, internal conditions is key factor, should train students' ethics, knowledge, ability, thinking, physical. the TRIZ theory is made as course, to guid students to master the tools to enhance students ability to use the theory of TRIZ, to provide reference for improving the teaching quality of local university.

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Research and Practice of Entrepreneurship Education Reform: The Case of Wenzhou University

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Abstract. This paper deals with the research and practice of entrepreneurship education reform. More specific it presents the experience of the Wenzhou University in China as a case in point for discussing how to establish the entrepreneurship education system. The main argument is that entrepreneurship education in University should not result as an application of policy initiatives only related to increase the employment rate of graduates. It should be part of a more general discussion related to educational priorities and of a strategic design of University talents training plan in order to provide students with entrepreneurial and management skills that will enhance their profile in the future career.

Keywords: Entrepreneurship education, college students, Wenzhou University.

1 Introduction

Nowadays entrepreneurship has emerged as an import mechanism for the generation of social returns in terms of economic growth and job creation, and the provision of entrepreneurship education in the higher educational sector has attracted a great deal of attention, so there is a significant interest in entrepreneurship education in universities world-wide, including those in China. Data show that in 2010 more than 20000 business competition, business forums and other activities held around the universities and more than 300 million students participate in. [1] In this paper, entrepreneurship education has been considered as one way of shaping entrepreneurial skills, competencies, attitudes and culture as well as of facilitating entrepreneurial activities. (However, the impact of entrepreneurship education should not be assessed in terms of start-up rates upon graduation but in terms of more long-term benefits) [2] However, many universities feel encountered a bottleneck in the development of entrepreneurship education at this stage. In the future, what should entrepreneurship education focus on and how to achieve leapfrog development of entrepreneurship education should need to further explore and practice.

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2 Issues in the Field of Entrepreneurship Education

Since 2001,policy initiatives in China have been encouraging entrepreneurship education especially in higher-education. The Ministry of Education has adopted a top-down approach to promote introduction of entrepreneurship courses in all China Universities. But there still some specific problems are observed:

Whether teaching should be for entrepreneurship or about entrepreneurship. There are several reasons why students might want to study entrepreneurship: they may want to start up a business of their own, but they may also be interested in acquiring and developing general knowledge about entrepreneurship based on an intellectual ambition. So the scope of entrepreneurship education is much wider than training on how to start a new business. It is important to offer a complete course or set of courses that analyse the whole entrepreneurial process-from the venture idea to the newly formed business's strategic success.[3] A recent survey conducted in 2008 pointed to this issue as being one of the limitations of the introduction of entrepreneurship education in China Universities. Up to now most university faculties focus mainly on the start-up phase of a new business.On the other hand, entrepreneurship courses are offered mainly on a stand-alone basis, although a systematic effort is being carried out to integrate them in a more coherent framework. So far, only a few faculty members have been engaged. Unless these courses are integrated in a coherent design of professionals curricula, continuity cannot be ensured, as public support is provided only for the introduction stage of entrepreneurship education.

Since the development of entrepreneurship education in the country until more than ten years, all colleges and universities are facing a huge shortfall of entrepreneurship teachers. One problem is educators are not specialised in the field of entrepreneurship, firstly because there is a general weakness in the supply of entrepreneurship educators related to the lack of master or doctoral programmes in this field and secondly because the people involved in the university come from other disciplines. [4] In addition, the structure of the enterprise education teachers should to be improved. Enterprise education teachers in the United States often both with entrepreneurship academic background and practical business experience.,while univeristies in China are lack of such dual-qualified teachers.

3 Case Study: Wenzhou University

Wenzhou University (WZU) has been selected as an illustrative case study. It is one of the universities which are earlier to carry out entrepreneurship education. Particularly in 2009 when it established entrepreneurship institute, entrepreneurship education has become one feature of WZU.The main objectives of the WZU entrepreneurship education are: ① to inspire students to see themselves as possessing entrepreneurial capabilities, by developing tacit knowledge, necessary skills and capability of understanding and judgement. This can result to the development of self-confidence and self-efficacy in organising and executing the actions required for undertaking a new venture.② to support potential entrepreneurs

by means of specific structures to materialise their ideas.Now the university has gained some useful experience about entrepreneurship education. There three components are further discussed below.

3.1 The Campus Culture of Entrepreneurship

The entrepreneurial campus culture is the new growth point of the campus culture construction. On the one hand, entrepreneurship education fully rely on the Wenzhou Chamber of Commerce, trade associations, alumni and other resources, actively seek the policy support of Trade and Industry Bureau, Local Taxation Bureau, Personnel bureau and other government departments, also seek public opinion to support. On the other hand, the university extensive use of various media to promote the entrepreneurial campus culture, including the timely publication of government preferential policies to support entrepreneurship, establish the typical entrepreneurship student star, carry out a variety of entrepreneurial activities.

3.2 The Reform of Entrepreneurial Talents Cultivating Pattern

WZU for three students to entrepreneurship education based on the different education goals.

Firstly, for all students, WZU mainly sets the entrepreneurial elective course and held various entrepreneurship education forums, focus on entrepreneurial awareness training. WZU elcetive course includes entrepreneurship education module, which has three types courses. One is the entrepreneurship foundation courses, such as “Contract Law””Leadership””Risk Management”. One is entrepreneurship courses with regional characteristics of Wenzhou, such as “Wenzhou model and Wenzhou Entrepreneurship”” Wenzhou Economic Overview”” Case of Wenzhou Entrepreneurs”. One is the inter-disciplinary design of entrepreneurship courses, such as “Commercial music management”” network entrepreneurship”” tax planning and entrepreneurship”. Each students must obtian two credits in the course of entrepreneurship education module. In addition to increasing the number of entrepreneurial elective course, we also reform the forms of the curriculum,such as “Know About Business”.through forming excellent teaching team , preparing lessons collectively and sub-topic of teaching, the reform achieved good results. To exploire and protect of the entrepreneurial enthusiasm of the students, WZU also held various “Entrepreneurs Forum”” alumni business dialogue” amd other cativities high-density. For example, as the contractor of Wenzhou Student Entrepreneurship Forum, WZU invited many well-known entrepreneurs and entrepreneurship research scholars to lecture for all students.

Secondly, for the students with entrepreneurial enthusiasm, WZU offer entrepreneurship education classes to develop students’ entrepreneurial talents. The past two years, the university has opened several entrepreneurship personnel training reform classes such as entrepreneurship pioneer classes, entrepreneurship management double major classes and shop manager classes. All classes recruits outstanding students of various professionals and entrepreneurial potential for

entrepreneurship education systemly.The reform includes curriculum, teaching methods, teacher-building ,assessment methods, quality control, etc. Wenzhou has distinctive regional culture characteristics of pragmatic and innovative since ancient times. With the economic and social development, the integration of traditional local culture and modern commodity economy came into being "Wenzhou Spirt", which now is the culture symbols of Wenzhou. So Entrepreneurship education is not simply copying foreign educational theory and practice, but highlight the regional characteristics and strengthen the practice. Now we develop a common pool of educational resources, including theoretical material (fundamental and in-depth analysis issues), case studies and specific software tools that help students to receive/acquire 'hands-on' applicable knowledge and skills regarding business practice (business game, feasibility study, business plan, financial analysis). The students evaluated very high entrepreneurship syllabus, the quality of the teaching material and tools, interactive methods used and the presence of support infrastructure.

Thirdly, WZU try to integrate the entrepreneurship education and professional education. A survey to the graduates revealed a strong belief that economic and managerial courses as well as entrepreneurship courses in particular could prove beneficial for the professional learning, the integration of entrepreneurship education in scientific and technological fields of study reflects the broader trend of graduates of such programs choosing careers in private industry over the more traditional academic professional path Focus on the training model and the curriculum, WZU reform the current training plan. We highlight entrepreneurship education as a thread that has increasingly become woven throughout the disciplinary fabric of higher education, and promotes the introduction of a specitic course in entrepreneurship, dependently of the specific needs of the University and its syllabus. And an entrepreneurshio course could be introduced horizontally to all faculties with taking into account the content and tructure of their curricula. Now WZU are constantly strengthening the knowledges of management and production about some professinals which closely contact with local industry such as shoes, apparel industry, electrical industry, optical industry,etc. Exposing science and technology students to entrepreneurship education provides them with knowledge and skills that are highly applicable to the knowledge economy. As a result, students receiving degrees in science and technology become entrepreneurial agents in the privatization of public knowledge. Accordingly, students are becoming knowledgeable in market-oriented areas such as intellectual property protection and are seeking out the resources such as entrepreneurship education to aid them in developing the skills necessary to personally capitalize on identified commercial opportunities.

3.3 The Multi-channel Entrepreneurship Practices

This is the experiential component, which aims at the inspiration and stimulation of undergraduates through interaction with practice. WZU build a "three-tier interaction" entrepreneurship practices platform, including Entrepreneurship Workshop, College Venture Center and University Pioneer Park. Students are encouraged to learn through the experience of Wenzhou People, and a number of

outstanding students entrepreneurial team are successly hatched. At the same time, WZU provide full real entrepreneurship platform on campus which is different from the entrepreneurship park to experience a more realistic opportunity to practice entrepreneurship venture. A more realistic opportunity to practice entrepreneurship Venture. For example, there are a vending machine business projects in teaching areas and a living area shops for lease cooperating whith School Propety in the living area. Also, we actively expand multi-level entrepreneurship practices platform in full use of small and medium private enerprises and other social resources in Wenzhou. Students can be as Chamber of Commerce assistant, business manager assistant, business executive assistant, assistant manager and other forms to entrepreneurial practice.

4 Conclusions

Entrepreneurship education has been well documented as one of the fastestgrowing academic trends in higher education.«National long-term educational reform and Development Plan»(2010-2020) made it clear that we should vigorously promote entrepreneurship education in colleges and universities.Currently, many universities are actively exploring the reform of entrepreneurship education model, but it must be noted that entrepreneurial talent cultivation in China is still at the exploratory stage. In the next decade, we should establish what kind of education philosophy, what kind of personnel training task, and how to training, these problems all need further exploration and practice.We propose that entrepreneurship education could achieve leapfrog development when changes in the three focus: from increased employment rate to raise the employment level, from the traditional extensive culture of entrepreneurship education to the integration of entrepreneurship education in scientific, technological and other fields, from training entrepreneurs mainly to training intrapreneurs.

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Formation Strategies of Innovative Practice Ability Based on Its Constitution Elements

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Abstract. Based on the four constitution elements of innovative practice ability (IPA) which are respectively innovative practice motivation, conventional IPA, professional IPA and comprehensive IPA, the formation strategies of IPA have been discussed. How to inspire innovative practice motivation, enhance conventional IPA, promote professional IPA and accumulate comprehensive IPA has been analyzed. The research results show that for innovative practice motivation, to initiate and to last are the keys. Conventional IPA has been formed by enhancing the constitution elements of the knowledge, and professional IPA has been obtained from the problem solution logics, the thinking mode of special knowledge, the targeted training in practice fields, and so on. Only when facing the practical problem situations and breaking the psychological tendencies, comprehensive IPA could have been continuously accumulated. The above strategies provide instructions for cultivating IPA.

Keywords: Innovative practice ability, Formation strategy, Constitution element.

1 Introduction

As well-known, the constitution elements have been composed of innovative practice motivation, conventional IPA, professional IPA and comprehensive IPA. But it is always vague for education in universities how to realize IPA. So it is necessary to discuss the formation strategies of IPA.

2 Inspiring the Innovative Practice Motivation

Innovative practice motivation is the key factor to form the IPA, which comprises of two stages, namely, the initiating stage and the lasting stage of innovative practice motivation. The individual desire to carry out some practice has been inspired at the initiating stage of innovative practice motivation, and the innovative practice activities could have been going on at the lasting stage of innovative practice motivation[1].

The innovative practice motivation derives from two aspects. Some motivations are from the intrinsic need of the individuals. There are various psychological

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demands at different level because of the different intellectual potential for different individuals. The individual internal needs constitute the premise and the psychological foundation to form and develop innovative practice motivation, it is the intrinsic motivation, and it is not easy to change and even disappear due to the external environment. Some motivations derive from the external threats and pressure, such as the practice provisions in universities, and practice tasks from teachers. The external practice motivation is positive at some degree. Generally, not all students are engaged in practice activity from the intrinsic need at initiating stage of practice activity. It is necessary to adopt some measures such as making corresponding regulations, determining the base line of practice activity and imposing the moderate practice pressure to force students to engage in corresponding practice activity. But the external motivation is usually unsteady and difficult to keep enduring.

There are psychological factors for generating innovative practice motivation. Some students expect to obtain praise and honor or win the status by accomplishing the practice tasks or to realize self-value. Some expect to solve practical problems, or to achieve psychology satisfaction by finishing the practice activity. Such requirements should be reasonably met, so the practice motivation of students could be spontaneously formed for the self-value realization.

In order to cultivate the innovative practice motivation, it is necessary to timely provide various circumstances required for prompting psychological need into practice interest and practice achievement motivation. Practice tasks should be chosen in daily life, which help inspire the practice interest. The individuals always pay attention to the things around ourselves, and pay little attention to the unreachable things. The practice tasks should have proper difficulties, and it is better to be close to the critical point of students' practice ability so that the practice tasks could be successfully accomplished after enough efforts. The practice tasks should bring the sense of achievement for all students. There are more or less need about winning recognition, praise and respect in the depth of each student's heart. If the failures usually happen during the practice activity, naturally the innovative practice motivation could not be maintained.

From the generating of practice motivation, the individual intrinsic need and the external incentive condition are the breakthrough point of cultivating innovative practice motivation. From developing of practice motivation, the development level of practice motivation derived from the pressure is lowest, and the resulted drive is in a relatively lower stage. However, the recognition drive and the public responsibility drive belong to the practice interest is in a relatively higher stage. So, based on respecting the various psychological needs, the status and the value of the different psychological need during generating and developing the individual practice motivation should be determined. Also the external motivation should be timely translated into the intrinsic need, so practice motivation aimed at winning respect could be changed into recognition and self-fulfilling drive.

3 Enhancing Conventional IPA

The undergraduates have already possessed certain knowledge, experiences and thought foundation, and the conventional IPA has already been come into being. The things need to be strengthened include constitution ability of knowledge, forming the self-consciously psychological tendency of constructing knowledge, obtaining the basic concepts and principles of the most universal significance and the most easily transfer, and mastering the logical method to construct basic structure of subjects.

If the knowledge constitution could be regarded as a way of living or a study habit, the formation and development of knowledge construction ability will have a driving force. The cognition development and the knowledge construction ability of students are a complementary process. To develop the cognitive level could promote knowledge construction level, and to increase knowledge construction ability would put the individual cognition into higher developed level. The declarative learning is the most effective way to achieve the individual knowledge construction, and the instilling way is the barrier to hinder the development of knowledge constructing ability. Therefore, it should avoid imparting knowledge mechanically and blindly, and to the greatest extent guide students to carry on declarative learning[2].

Knowledge construction needs establishing the inner link between new knowledge and old knowledge in the brain. The available information and experiences of the individuals may play no role to knowledge construction. Some content may be forgotten, and some are included among the established knowledge network. Only a small number of content become the anchors between the old and the new knowledge, which is usually the most general and widest concepts and principles. Such knowledge will help optimize knowledge structure, and mastering the basic structure of the disciplines will help construct the knowledge. If the appropriate learning experience and the right statements to the structure have been given, the gap between the senior knowledge and the primary knowledge could be narrowed. The American psychologist, named AuSuBel had thought that it was relatively easier for students to master part of knowledge from the wide overall known knowledge than to master the overall knowledge from the known part knowledge.

4 Promoting Professional IPA

Promoting professional IPA should be carried on according to the logic to solve problems, which could make students understand the special knowledge more actively, extensively, and deeply. Through the problem solution with the special knowledge, the applicable condition, the internal rules and the effectiveness of special knowledge could be naturally inspected, and the original knowledge and experiences could also be gotten rich and full [3].

To enhance professional IPA, the problem situation should be designed based on the content of the special knowledge. It could make students obtain the special knowledge and the related conceptual understanding by the problem solution, and

understand the applicability features of the special knowledge through the corresponding description to a certain type of problems based on owned special knowledge. And then it could make students know how to solve these problems with the special knowledge through clarifying the solution methods for a certain type of problems.

The premise of special knowledge application in solving practical problems is that the individuals have already understood the related special knowledge. And the more perfect the special knowledge structure system is, in the face of the specific issues, the higher the efficiency of knowledge extraction and usage is, and the more outstanding the IPA is. Therefore, it is necessary to enhance the cultivation of special knowledge construction ability. And more attention should be paid to the measurement and assessment of the ability to solve practical problems with the special knowledge. The teaching focus of special knowledge should be put on revealing the internal logic relation among various factors of special knowledge, deducing the intrinsic ideas of special knowledge formation, evolution and development, showing the matching relation between special knowledge and corresponding solved problems, and so on. The purpose is to make students understand the special knowledge formation deeply so that the special knowledge could be rationally contained in the cognitive structure, and the construction ability of special knowledge could be enhanced.

The application of special knowledge in solving practical problems has to undergo the thinking process from characterization to imagination, from analysis to classification. With strengthening the training of thinking process, the effect of special knowledge application would be improved. When facing practical problems initially, usually the individuals may meet with the difficulties in the process of characterization, imagination, analysis and classification. The targeted guidance and training should be undertaken. In the process of characterization, the observation and understanding to the problem situation may not be paid enough attention. After the impressions are roughly formed, the individuals would be eager to try or guess the solution. The key information to solve problems may be omitted. It is possible that the individuals do not master the characterization methods, and lack of characterization skills. So when the individuals face practical problems, he doesn't know how to do. Therefore, some characterization strategies should be taught to students, and good characterization habit should be cultivated for students. In the process of imagination, it may be difficult for students to imagine, or to activate the existing special knowledge. Even the imagining content is error. The reason is the wrong understand for special knowledge itself. It should continue to strengthen understanding and construction to special knowledge. In the process of analysis, it may be difficult to match specific problems with special knowledge. So the analysis skills should be consciously trained. In the process of classification, although the problems could be matched with the corresponding special knowledge, when the similar problems appear, it is still regarded as unfamiliar new problems to the individuals. So, specific problems should be incorporated into existing special knowledge structure, and the summarized imagination should be formed.

The special skill is directly related with the practice problems. The implementation of practice ideas in practice activities and the practical effect of solving problem depend on implementation effect of special skills. For cultivating practice ability, the formation and development of special skills must be paid more attention. Enhancing students' special skills must be based on the requirement of developing potential and interest, which could consult the cognizance standard of the professional qualification in various sectors of the society. And the special skill training could be purposefully and designedly carried out. The analysis in various fields of specific profession could be also carried on, so that various special skills required by their corresponding fields could be concluded with scientific method, and the skill requirement may be acted as the reference index to train the special skills in corresponding professional. The special skills owned by the individuals are the results of the continuous training and practice. To cultivate the special skills, the necessary practice resources must be provided, and the conditions such as professional laboratory and practice base should be improved. Teachers should have not only good academic attainments, but also the abundant experience and insight of solving specific problems with corresponding special skills. For students, the curriculum resources play a key role in determining the basic development direction of special skills, and the quality and degree to master special skills. So the curriculum resources about special skills which could be chosen freely should be provided according to the social need and development level of students' special skills.

5 Accumulating Comprehensive IPA

The comprehensive IPA is gradually formed based on constantly solving practice problems, and repeatedly strengthening matching and analysis ability, planning ability and executing ability. Only when the practical problem situations are faced, psychological tendencies is broken, the comprehensive IPA could be continuously accumulated[4].

The practical problem situation is the best way to accumulate comprehensive IPA. The virtual problem situation has three unavoidable limitations during the training process of students' practical ability. The results of solving virtual problems are usually unrelated with vital interests, and therefore the corresponding analysis ability could not be trained. The virtual problems are usually simplified or abstracted from the practical problems, which complexity is far lower than the real problems, and the judgment ability is inevitably at the preliminary development level. The problem solution could not be carried out completely under the virtual problem situation, and usually the problem solution process would stop when the design and choice of solutions have been completed. So the execution ability could not get full development, and then to cultivate students' comprehensive IPA, the practical problem situation must be created. The practical problem situation requires urgently the individuals to solve the problems, and then the various information of practical situation could be naturally and fully shown. The practical tasks could be finished only through the each practice stage for the individuals.

Many problems seem hard to be solved. It is because of the psychological tendencies. The individuals usually ignore the analysis and judgment for nature of the problems and relations between factors, and always try to deal with the similar problems under new situations with the old solutions. The predetermined target usually could not be accomplished in such practice activities, and the practice ability also could not be developed. In this case, in order to effectively promote the comprehensive IPA, it is necessary to help the students break consciously the psychological tendencies, and cultivate the divergent thinking. And trying to solve the same problem with various methods should be encouraged.

6 Summary

Aimed at the four elements included in IPA which are respectively the innovative practice motivation, the conventional IPA, professional IPA, and comprehensive IPA, the formation strategies of the IPA have been discussed. These strategies will provide a guide for cultivating the IPA.

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Investigation and Analysis on Humanistic Quality Education of Science and Engineering University in China

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Abstract. Humanistic quality education is an important content of university student quality education. But in science and engineering university, its educational situation is not promising. The author takes Harbin Engineering University as an investigating object, and issues 350 questionnaires to undergraduates studying in science and engineering majors. With statistical results of questionnaires, the author states the situation of humanistic quality education of science and engineering university. The main problem existing in humanistic quality education is science and engineering university doesn't pay attention to it. The reasons that caused this situation are multiple, such as the traditional misleading concept of emphasis on natural science and neglecting social science, the educational location of science and engineering university, the limits of teaching time and so on. On the basis of reconsideration of existing problems in humanistic quality education, the author proposes countermeasures on raising humanistic quality education level.

Keywords: Science and engineering university, Humanistic quality education, Questionnaire.

1 Introduction

Humanistic quality education is the people-oriented education. It teaches students how to do and what to do to be a people. It focuses on building personality and Spiritual realm. Humanistic quality education can cultivate students' creative character and creative thinking, help forming good morals, develop imagination and keenness, and perfect students' way of thinking[1]. In our country, because of the pressures of examination-oriented education, students are lack of humanistic quality at large, especially students studying science and engineering. Even after entering university, most of students often pay attention to professional study and ignore the enhancing humanistic quality due to the influence of studies and employment pressure and utilitarian values. In recent years, the events of LiuHaiYang and MaJiaJue showed from a side that the humanistic quality education of undergraduates should be strengthened.

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1.1 Investigation in Present Situation of Humanity Quality Education of Undergraduates Studying Science and Engineering

According to the connotation of humanistic quality education and the setting of humanities courses in colleges and universities, combining with the characteristics of undergraduates, the questionnaire for humanistic quality education of undergraduates in science and engineering colleges were designed. Then, they were distributed to part of students studying science and engineering in Harbin Engineering University. There were 350 questionnaires issued, 331 copies withdrew, and the rate of recovery is 96%. Through the analysis of the questionnaire, we could know that there exist many problems which need to be further solved. These problems are:

(1) The degree of attention on humane quality education in science and engineering colleges should be improved. In the survey, 42.42 percent of the students think that the school doesn't pay attention to Humanistic education (16.36 percent) or not enough (26.06 percent). The reason is that it is hard for science and engineering colleges to cohere with the conflict of class hours between polytechnic professional core classes and auxiliary class of humanities social sciences. With the development of human society, the accumulation of science and technology knowledge becomes increasing and more refined. In order to meet the needs of students' learning and employment, new classes are increased and old ones are remained, which make the allocation of class hours extremely tense. Although at present all the colleges set up the courses of humanistic quality education, these curriculums are often elective courses, which inevitably affect learning outcomes. 41.21 percent of the students think that at present the courses of humanities and social science are in extreme lack. 12.73 percent of students think it just a little short. when answering the question "how about the condition of improving students' humanities quality provided by the school", there are 33.94 percent of students showing their dissatisfaction, 50.30 percent being general and only 15.76 percent of students feeling it good or very good.

(2) Science and engineering colleges are in lack of humanistic teachers. Humanistic quality education couldn't be implemented without teachers' participation. At present, the humanities teachers in science and engineering colleges are relatively scarce. The reasons are varied, but the major are two reasons: First, it is often difficult for science and engineering college to give humanistic teachers a large space for development. As specialized feature of the school is science and engineering, it often doesn't pay enough emphasis on the development of the humanistic science, which limits the development of humanistic teachers. Second, humanistic teachers are without high enthusiasm to work hard in concern that their professional and career won't be taken seriously in science and engineering colleges. The overall evaluation on teaching level of humanistic course teachers is general (as shown in figure 1).

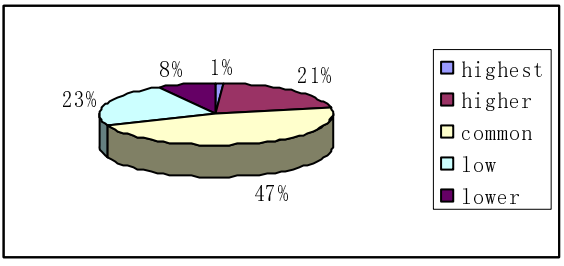

Fig. 1. Total evaluation on teaching level of humanistic teachers

(3) Undergraduates in science and engineering university are lack of understanding to humanistic education. Judging from the survey, 26.67 percent of students believe that they have contacted with the conception of “humanistic quality education", but just "often heard". 47.27 percent of the students are "not familiar with" the conception or "a little understand". Only 26.06 percent of the students are full of confidence that they are “a little familiar with” (19.39 percent) or "familiar with" (6.67 percent) it. From this group of data, it may conclude that humanistic quality education of college students is not blank, but still very scarce. Due to the pressure of learning, students have no time reading books on this aspect before entering university campus, especially the students studying science and engineering. So it becomes necessary for college schools to open humanistic courses, arrange humanistic teachers and guide the study of students.

(4) Students have accumulated a certain number of humanities knowledge. Due to the excessive emphasizing on practicality and utilitarian of professional technology, part polytechnic students ignore learning humanistic course that caused the lack of humanistic knowledge. Many students have little basic knowledge of culture, history and philosophy, bad ability to express, lower artistic grade, and especially know little about excellent traditional culture of our country. Due to the increasing attention of humanistic quality education in higher education in recent years, the proportion of students who have read classics is increased. The questionnaire shows that 41.82 percent of the students have read the Book of Songs, 61.21 percent of students have read the Analects of Confucius, 42.73 percent the Records of Grant Historian, 43.33 percent Military Science of Sun Zi. The number of the students who have read Moral Classics and ZiZhiTongJian are only 16.97 percent and 21.82 percent. However, most students only optionally read or skim, and hardly read original works.

(5) Some undergraduates’ choices of life value are partial. On the belief, most students select "communist", accounting for 53.94 percent. The rest of the students choose "pragmatism, individualism, religion and others". About joining party, 85.45 percent of students have had the desire of joining party and submitted the requisition for joining party. Only 14.55 percent of students choose “without consideration temporarily" or "with no interest". In the problem of "your life pillar is", 50 percent of students chose "knowledge". It shows that value orientation of most

students is positive and health, which embody their positive life attitude. But those students choosing "money" and "power" still occupy a proportion which cannot be ignored.

1.2 Reconsideration on Present Situation of Undergraduates' Humanistic Quality Education in Science and Engineering University

(1) Traditional education ideas mislead education. The rapid development of natural science has become the great strength to push social progress and bring wealth and interests to the human society. But it is hard for humanistic and social science to promote social economy directly and clearly, which make people form the idea to neglect humanistic science but attach importance to natural science gradually. Under this thought, the function and responsibility of science and engineering university is located in imparting knowledge and skills training. Such education mode has single discipline and neglects humanistic quality education. Teachers have the familiar ideas. The college students in science and engineering university have such misconceptions, too. They focus on learning of major courses and ignore the humanistic social science. This misunderstanding of education idea is bound to limit the development of humanistic quality education in a long-term.

(2) Science and engineering universities have not enough attention to humanistic education. On one hand, it is partly due to professional in science and engineering. After all, it is not easy for the officers to not only satisfy imparting professional knowledge, but also give a space to humanistic quality education. On the other hand, science and engineering universities have not enough emphasis on humanistic education, which is relatively the important reason. Although in many meetings and reports, improving university students' humanistic quality education appears ceaselessly, it doesn't make into reality in actual teaching settings. Humanistic education of universities isn't satisfied according to educating idea, teaching management and teaching time.

(3) Exam-oriented education causes congenital dysplasia of college students' humanistic quality. At present, our country implements mainly exam-oriented education. Under the pressures upon entering a good higher school, students can only put limited energy into learning of exam course and have no extra time and energy to learn other knowledge, even basic ethic and art fundamentals. Just as students are lack of humanistic quality education before enrolling, they are short of humanistic spirit and creative thinking after becoming undergraduates, which causes the situation of congenital dysplasia and landslide of university students' humanity quality. In recent years, the university entrance exam system has been reformed, but the reality of examination-oriented education is still not changed.

(4) Settings of courses are not reasonable enough and some courses are often difficult to open. In the humanities courses which have been set, there are many courses that students could have due to the limited number to open a course. These students who have chosen it have to select other courses in the new semester in order to achieve the requirements for credit hour. It is very common in colleges and universities. Such rules are reasonable superficially, but in fact it ignores the

demand of students, and makes the students from the active learning with interest to the passive learning in purpose of satisfying the requirement of credit hour. It is harmful to cultivate students' personality, which ultimately led to the loss of students' value rationality.

1.3 Countermeasures on Improving Educational Level of Students' Humanity Quality in Science and Engineering Universities

(1) To update educational ideas. First, correct goals of humanistic quality education must be set up. Humanistic quality education in science and engineering university take students as educational object, have humanistic and social science as educational contents, cultivate and edify their psychologies, views, feelings, behaviors and so on by varied educational activities, and promote the comprehensive enhancement of their quality. Second, innovate teaching ways according to the student-oriented thought. Teachers should be aware of their status of object in the teaching process, adhere to the student-oriented principle, adopt heuristic method and discussion in teaching, turn students' status from passive learning to active participate in discovery of knowledge by methods of discussion in class, students' lecture, topic discussion and so on, forester the students' ability of autonomous learning, and arouse their consciousness of independent thinking and innovation.

(2) To perfect the curriculum system of humanistic quality education and raising the rate of opening courses. The purpose to implement humanistic quality education in polytechnic university is to perfect talents quality, not to cultivate experts in the humanistic field. It should realize the function of education to explore the potential within students, perfect students' quality, stimulate students' creative desire, and cultivate students' innovative ability. Classroom teaching is the main way of college students to learn. Therefore, in order to strengthen humanistic quality education in science and engineering university, course system of humanistic quality education must be constructed reasonably. In the curriculum system, it should be appropriately increased humanistic courses focusing on culture and life of human beings such as philosophy, linguistics, literature, literature, art, history, etc., courses of social science focusing on the relationship between human beings and society such as political science, economics, sociology, law and anthropology, and the courses of modern communication and psychological adjustment such as public relation and etiquette, psychology of intercourse and mental health. In teaching management, it should loose the restriction of minimum number of classes, try to meet the students' learning needs, make every student study their favorite courses, and enhance their learning interest.

(3) To strengthen the humanities consciousness and accomplishment. A real educator always looks student's growth as his career. The most fundamental problem of humanistic quality education is to educate students how to be a person. It is consistent with teaching work in essence. Teachers should go first in humanistic education. If the teacher does not set up the view of humanistic education and have humanistic qualities, the school education would not exist. Such humanistic spirits as respect, understanding, communication, trust, morality, enthusiasm, love,

etc. should embody in educators. Whatever is the nature of the school, educators should be a person full of humanistic care and with strong personality charm. Only in this way, education can really touch hearts and not just provide skills for students, and influence their lives and not just at that time[2].

(4) To strengthen the construction of campus culture. University education of humanistic education should not only penetrate in teaching, but also need the edification of campus culture. As Stephen Leon said, anything really value is its surroundings[3]. Campus culture refers to common campus values of all members, a particular atmosphere, and materialization of these values on material and ideology. It includes three aspects: material culture, spirit culture and system culture. Good humanistic atmosphere has great influence on humanistic education taking class as its center, and is an important implicit course in the university. Under the impact of diversified values, the construction of campus culture must adhere to take Marxism and Deng Xiaoping's theory as guidance, create humanistic spirits to help cultivating students' rationality.

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Exploration on the Reform of Mechanical Engineering Graduates' Quality Education

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Abstract. Recently, it becomes more and more prominent that the professional practice abilities of graduate students of mechanical engineering disciplines are weak. The reasons why China's manufacturing productivity is extremely low compared with developed countries are analyzed in this paper, the quality of engineers is one of the important reasons. Facing the global financial turmoil, the mechanical engineer certification of manufacturing country should speed up with international standards. The reforms how to improve the quality of mechanical engineer graduates' education are also explored. In the last, we conclude that strengthening cooperation among industries, universities and research institutes can break the bottleneck of basic engineering quality of mechanical engineers, improve the design and production ability engineering graduate students, deliver more qualified personnel for enterprises and promote the work of professional certification of higher engineering education.

Keywords: education reform, graduate quality, mechanical engineering.

1 Background and Current Situation

"Engineering science and technology in promoting the progress of human civilization have always been playing the role of the engine." [1] In the backdrop of economic globalization, the professional accreditation of higher engineering education which plays more and more important role is the important guarantee to promote engineering and technical talents participating in international mobility.

It should be emphasized that the professional accreditation of higher engineering education system in most universities in our country has not caused enough attention. In particular, mechanical engineering graduate of the professional training from the basic engineering quality requirements of the enterprise are far apart.

One obvious fact is that the problem of engineering education in China excessively put up theoretical tendency, one of the features is education paying too much attention to academic performance, but ignoring the more important of engineering design and production practice to mechanical engineers. This is particularly prominent in the machinery industry, the harm is so serious.

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On January 12, 2008,Yansun Lu, the Special Adviser of Machinery Industry Federation of China, made a report entitled «Situation of Machinery Industry Development Training and higher education» on the second inaugural Committee of machinery and electronic teaching of the Chinese Education Association of Machinery Industry. The report analyzed the situation of higher engineering education from the economic and social development needing of the engineering and technical personnel, state of development of higher engineering education and other aspects,. It also pointed out that the existence of Higher Engineering Education : the "engineering-oriented" is not enough, practice teaching is weak, the target of personnel training is not clear enough, the training methods don't meet the actual demand, course content is outdated, teaching methods is not so rich and graduate employment is difficulties and so on. [2]

It becomes more and more prominent that the professional practice abilities of graduate students of Mechanical engineering disciplines are weak.

2 Analyze the Reasons

As a manufacturing power, China's manufacturing productivity is extremely low compared with developed countries. In addition to equipment and other factors, the quality of engineers is one of the important reasons.

The bottleneck of quality training of basic engineering of mechanical engineers and the deeper reason are the reform of higher engineering education problems that can not be avoided. The current facts and in-depth analysis shows that:

1) The teacher's own ability of engineering design and production practice is weak. Currently, the source of mechanical subject teacher in many colleges and universities, mainly doctors and masters graduates from the college, is single. They re-enter the school from the school, learn at school, work in the schools, don't have work experience and experience in the production line and know little about the operation of enterprises. Most of young teachers emphasis on writing papers to get the academic achievement evaluation of title, so they have no time, energy and motivation to focus on the enhancement of their practice of engineering design and production capabilities. However, the practical abilities of teachers directly determine the ability of students' engineering practice. It is hard to imagine that the weak teachers of engineering design and production practice can cultivate students with higher ability.

2) The schools concern about the quality of teaching more focusing on classroom teaching. Mechanical Discipline's own technical and practical teaching contents are constantly being weakened, so graduate students feel "Learning" has nothing to do with "do". Many schools on the experiment, practice, practice inadequate understanding of the difficulties, it is difficult to mobilize guiding the experiment, practice, practice teaching in the teacher's enthusiasm. In the Long time, it's very unfavorable for the improving of teachers' teaching capabilities of the machinery of the professional practice, the cultivation of perennial engineering quality of graduate students.

3) The evaluation of graduate education is not reasonable. The research and papers account for a larger proportion in evaluation of the school and university rankings, while the practical ability of the engineering graduate of university is often payed inadequate attention. The schools emphasis excessively on the progress of theoretical as evaluation of the academic development of the school, lack of adequate feedback of graduate employment in the enterprise and targeted reforms of high quality training of the project of practical requirements of the senior mechanical engineer.

4) In the formulation of professional standards of higher engineering education, industry participation is very few. The standards and certification of engineering in developed countries are mainly resonponsible by national engineering organizations. engineering personnel training standards are mostly proposed by industry. The professional norms of higher engineering education in China in recent years are developed under the leadership of experts from the education sector. The curriculum is needed further matching industry requirements. some of the teaching content and requirements of profession are still as fellow: heavy books but light experiments, heavy theory but light practice, heavy hours but light effect and other problems.

5) The state-related incentives are not enough. Many companies now pay more attention to temporary economic benefits, don't care training for senior personnel, are reluctant to provide funds, equipment and other support and are not willing to host students and teachers to practice teaching. In recent years, many effective teaching practices because of the actual production conditions were not also ignored. Over the past planned economy, college students can be arranged by the State's practice, allowing students to participate in the production, but now the process of cultivating talent in universities are out of touch with the business trending more and more serious phenomenon.

3 Exploration in Reform

Facing the global financial turmoil, the mechanical engineer certification of manufacturing country should speed up with international standards. As the mechanical discipline is characterized by strong professional practice, we need to train engineering talents that can transform finding, inventing and creating into products or technology applied to the actual production.

What these problems need to be solved are how to improve the quality of training mechanical engineers and how to make the higher engineering education, especially the training of graduate students, to keep up with new technology, new processes and new product development of enterprises that request for the engineering and technical talents.

I believe the methods that break the bottleneck of mechanical engineer quality training are reforming the combination of research-oriented policies and educational evaluation in higher engineering education and are shown in Fig.1.

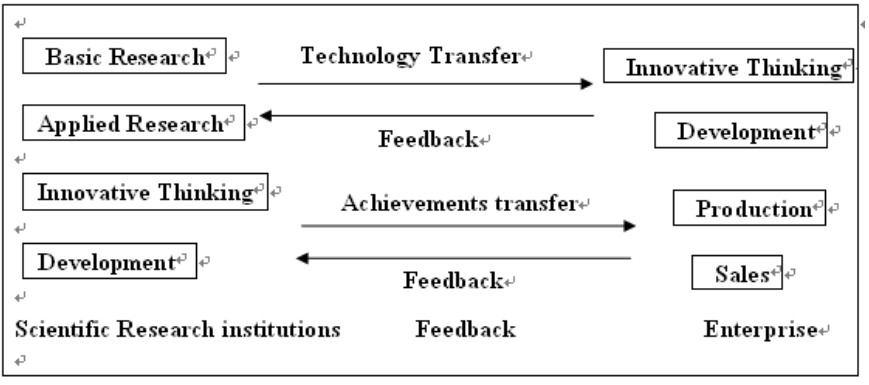

Fig. 1. System configuration of research institutes association

What the core should be pointed out is that the government should increase the support for the combination of research and production, that is to say, the government should contribute to encourage companies and universities to joint into research and development teams in the national economy of the machinery industry and in the mechanical discipline of colleges and universities. The government should increase the research of the practical skills in the longitudinal research project. Take the effect of scientific and technological achievements checking and accepting vertical and horizontal machinery research as the key indicators of the professional evaluation in mechanical education. (This is just the meaning "research" of the production and research described in this article rather than the usual sense of the scientific research institutes).

The key to be emphasized is to mobilize the enthusiasm of both universities and companies, to make human resources, technology, equipment, capital and other complementary advantages to realize supply and demand coordination, resource sharing and promoting school-enterprise cooperation and common development.

Promote the combination of production and research. Take the practicality of research as the standard measuring mechanical discipline master's level of professional instructors. In masters' hiring, we should change the phenomenon weight academic but light application, weight identification but light promotion, heavy vertical subjects but light horizontal issues. This will fundamentally reverse postgraduate tutors on the emphasis writing papers, avoid many domestic universities' research in the embarrassment of no avail and prompt master instructor and technical personnel of business enterprises to participate in practical research projects. It can also improves master instructors' knowledge, ability and quality structure, makes them keep abreast of industry, enterprises of new technology, new achievements.

The improving of Instructor engineering practice ability will combine their scientific research with enterprise into practical teaching and training graduate programs. Through the integration process of teaching and practice, and research and application, we can adjust the curriculum, teaching content and the characteristics of professional research immediately. Make a combination of production and research throughout the whole training process of engineering education, it is

more close to the machinery industry enterprises and the actual production, improve teacher effectiveness in the classroom teaching, and enhance the ability of graduate students quickly adapting to work. In fact many examples show that the combination of production, study and research is the effective method to improve students' practice ability.

Setting up quality of the talent training is the first philosophy of education. Quality assessment in higher education, assessment of key disciplines, degrees awarded and construction assessment system should fully reflect the status and roles of cooperation among industries, universities and research institutes. The implementation of personnel training programs changes traditional teaching model to comprehensive model of integrated production and research. Enhance the feedback of graduate employment after graduation in the work of the enterprises. Take the enterprises' recognition level of postgraduate professional disciplines as the important evaluation index of each specialized master degree of mechanical discipline to form the policy guidance benefit of university-industry cooperation.

To all appearances, it is not difficult to achieve mobilizing the enthusiasm of schools, but more important and difficult to mobilize the enthusiasm of enterprises.

We should learn to accept internships for students of foreign companies reducing the tax method and mobilize enterprises to participate in cooperative education initiative with policies and mechanisms. The schools can take the initiative to help enterprises and technicians with theoretical training and the training of business-oriented Master of Engineering as well as in-service training of Dr, guidance and so on. In this way, we can close co-operation between schools and enterprises. Try to promote university-industry cooperation, fully mobilize the enthusiasm of enterprises. So the training of graduate Students will be extended from the classroom to the corporate, factory and production line. We can set up the second class in the enterprise and get the support of business-to-graduate students for engineering practice ability. Depth study should be able to develop production capacity and beneficial to all students in the implementation of the practice of teaching colleges, enterprises, research by the instructor, graduate students and business people to participate in advanced engineering talents to promote the ideas and models of change, completely solve the mechanical discipline graduate teaching content heavy books but light experiments, heavy theory but practice of light, heavy hours but light effect problem.

4 Conclusion

Strengthening cooperation among industries, universities and research institutes in the discipline of mechanical engineering education and the machinery industry of national economy can break the bottleneck of basic engineering quality of mechanical engineers, improve the design and production ability engineering graduate students, deliver more qualified personnel for enterprises, promote the work of professional certification of higher engineering education. All levels of education departments and other relevant departments of government can accomplish a great deal of things.

I wish a large number of highly qualified mechanical engineers growing quickly to become a manufacturing power from the manufacturing country.

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Hydropower-Based Research on Training Mode of Civil Engineering

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Abstract. With training of the actual work ability of our civil engineering students as the starting point, our institute works at making full use of the local resource superiority and highlighting the hydropower characteristics on behalf of improving the comprehensive competitiveness of students in employment. The "high-quality, high capacity, applied" talents are constructed to serve the local education and scientific enterprise. The research focusing on the exploration and practice of the school running features provides a certain reference to other similar institutes.

Keywords: Civil engineering, Characteristics of hydropower, Training modes.

1 Introduction

Civil engineering, one of the four traditional engineering majors, has a long history and wide coverage, involving almost all areas of national infrastructure. Currently, China and even the various countries are on the constant exploration and innovation of higher education in this field. Its personnel training modes and the education concepts are developing unceasingly. Entering a popular stage, the higher education of our country is being decided to take the road to diversified development. How to train highly qualified multi-skill talents to meet social demands is a new task which the higher education sectors face together now. The construction industry plays an important role in national economic and social development, but the overall quality of the employees are not so satisfactory. Particularly in great shortage, a large number of inter-disciplinary talents are needed to engage in the project design of civil engineering, construction and management. China Three Gorges University(CTGU), located in Yi Chang, the hydroelectric central city, was combined from the former Wuhan University of Hydraulic and Electric Engineering (WUHEE) and the former Hubei Three Gorges Institute. The WUHEE was originated from GZB Institute of Hydraulic and Electrical Engineering which was directly under the Ministry of Water Conservancy and Electric Power. That institute had a distinct feature and advantage in the field of

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hydroelectric power. The research, focusing on the school-running ideas, training targets, teaching modes and methods of the hydropower-based cultivation of the inter-disciplinary talents, is a new subject needs to be solved now in the training process of civil engineering in the university[1-3].

2 The Purpose and Significance of the Research

With the rapid development of China's economic construction, the demand size of high level, innovation and applied talents enlarges unceasingly, which puts forward stricter requirements for higher education. According to the state of many-year development of running a school, the Civil Engineering and Architecture Institute of our university plans to further improve the quality of teaching and highlight the exploration and practice of the school running features in this major under the guidance of the Scientific Outlook on Development. This project will provide a certain reference to other similar institutes.

(1)Our college makes full use of the local resource superiority, highlights the hydropower characteristics, by which is a feasible way to satisfy the demands of the local economic construction and social development and serve the education and scientific enterprise.

(2)Our college takes advantage of the current discipline teacher resources, builds more featured courses, vigorously promotes the quality project and improves the teaching quality for the purpose of serving the doctoral program construction of the Geotechnical Engineering and the Hydraulic Structure Engineering in our university.

(3)The policy of education-oriented and moral education come first is implemented throughout the teaching process. Our college carries out a series of measures in the persistent pursuit of adhering to the fundamental task of personnel training and establishing the training target of "high-quality, high capacity, applied" talents. At the same time, we are working at deepening the reform of education to construct a system of education with the goal of teaching students according to their aptitude as its central task.

3 Basic Conditions

Civil Engineering, the first established engineering specialty in China Three Gorges University, the discipline construction and major construction of which accesses to substantial progress after years of effort. The institute possessing good basic experimental conditions has accumulated abundant experience in talent training. There is a strong teaching and scientific research team, of which the quantity of the scientific research projects as well as the operation founds take the leading position in the university. In a word, Civil Engineering has become one of the school-level-brand constructions and settled a solid foundation for further study on the training modes of the hydropower-featured personnel.

(1) basic condition

The training of featured talents must have certain basic conditions and historical accumulation. As the school-level-brand profession, the civil engineering of our university has passed the assessment by Ministry of Construction twice. It has relatively mature training modes, practice-oriented settings, well-found experimental sites and a certain amount of trainee bases.

(2) work foundation

Our school has already established contact with the nearby large hydropower stations. Every year our students go there to carry on an on-the -spot inspection, which greatly promotes the enhancement of the ability of innovation and practice of them. Teachers participating in this project have strong practical experience and teaching ability.

(3) policy support

As great importance is attached to the cultivation of practical abilities of the students, the institute leaders gradually increase the investment founds to encourage and ensure the conduct of teaching and research.

4 Cultivating Patterns and Concrete Measures

In order to realize the target of training the civil engineering professionals featured by hydro-electric power , our college brings forward our own concrete measures for personnel cultivation considering the quality of contingent of teachers in relevant disciplines, the basic conditions of experiments, the enrollment scale and the comprehensive quality of those students.

(1) Rather than following the simplex training methods of those undergraduates majoring in civil engineering, we highly encourage our students to take some elective courses from other institutes in terms of hobbies and specialties in their spare time, know the prospect of development of hydropower indurstry and gain the professional knowledge to some degree. Meanwhile, we provide some optional courses about hydropower as the civil engineering ones encouraging those students to develop towards different specialty orientations.

(2) We foster professionals with the conciousness of innovation and the faculty of practice through guiding them to participate in the establishment of some innovative experimental project. On the other hand, our students can take part in teachers'projects and take advantage of the practical base to engage in the project design of civil engineering. In that way, we can promote the cultivation of practical ability and achieve positive results.

(3) As the practicalness stands out in the specialty teaching of civil engineering, we deepen the reform of education and increase the practical content by penetrating the experiment and field trip throughout the whole education process, in which the students could obtain practical ability after operating practically.

(4)Through altering the traditional education patterns and methods, we take full advantage of multimedia education conditions and net education resources exhibiting the framework, formation and constructing process of hydraulic structure, hydropower station, reservoir, side slope, road and bridge. Thus, for the students,

the scope of knowledge can be enlarged and the consciousness of the importance of civil engineering in hydroelectric engineering construction can be promoted.

(5) In order to make full use of the local resource superiority, we gain support from large-scale hydropower station nearby and set them as the regular practice bases, such as the Three Gorges Hydropower Station, the Geheyan Hydropower Station and the Shuibuya Hydropower Station. During the cognition practice, our students conduct on-the-spot investigations so that to increase their understanding and practical cognition of hydroelectric industry.

(6)Our college engages those experienced certified engineering technician to establish some relevant specilty courses and trainings about the test of industry and professional qualifications. (such as registered structural engineer, registered civil engineer, registered supervising engineer, registered cost estimator, registered constructor, register geotechnical engineer and so on).Through the establishment of these professional cultivating patterns combined by education with record of formal schooling and training of professional qualifications, we can cultivate our students'engineering attainment, professional craftsmanship and enhance the comprehensive competitive capacity in employment.

5 Training Target

Students are expected to realize the importance of civil engineering knowledge applied to Hydraulic and Hydroelectric Engineering through the research on the project. We intend to develop the hydropower-based inter-disciplinary talents and improve the comprehensive competitiveness of students in employment in order to better serve the local education and scientific career.

(1)We expect to increase the professional knowledge of the hydropower industry in the teaching of civil engineering to broaden students' horizon and make the students realize the importance of civil engineering knowledge applied to Hydraulic and Hydroelectric Engineering and develop students ' interest in hydropower industry.

(2)In order to satisfy the demands of the local economic construction and social development and serve the education and scientific enterprise, we plan to develop the hydropower-based inter-disciplinary talents with certain foundation of scientific research and the coordination ability.

(3) We intend to build a professional training mode which centers on academic education combined together with practicing qualification training to improve the comprehensive competitiveness of students in employment.

6 Main Problems to Be Solved

According to the state of many-year development of running a school, the study, ability training in actual work of civil engineering students as the starting point, strives for making full use of the local resource superiority, highlighting the hydropower characteristics, implementing the policy of education-oriented and

moral education first, adhering to the fundamental task of personnel training and establishing the training target of "high-quality, high capacity, applied" talents.

For one thing, We will omnibearingly promotes the comprehensive quality of our students according to the current states and requests of the research on engineering teaching. For another thing, we will practice constantly to get a feasible teaching method for the purpose of developing the hydropower-based interdisciplinary personnel.

Taking the target of improving the specialty knowledge and capabilities of students in case of future work, we are working at determining the specific content of teaching and research by carrying on in-depth investigations in the hydroelectric engineering and civil engineering related agencies.

7 Conclusion

With the practical ability of students majoring in Civil Engineering as a starting point, our institute tries to make full use of the local resource superiority and highlight the hydropower characteristics on behalf of improving the comprehensive competitiveness of students in employment. The "high-quality, high capacity, applied" talents are constructed to serve the local education and scientific enterprise. The Research results will be first applied to the 16 classes of civil engineering department in our university. Along with the increasing maturity of the research methods, it can be used in Hydraulic Structure Engineering, Road and Bridge Engineering and other related majors. The number of benefited students is annually about 500-1000 around. Seen from a long-term perspective, the research result which can be generalized to water conservancy, construction, transportation and other relevant engineering colleges, will have a bright future.

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Construction for the Online Education Evaluation System of Adult Higher Education

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Abstract. Learning style for the adult higher education of computer network breaks the limits of traditional education, which can make students arrange their own study based on their own time and open a new way for the adult students to accept the study of higher education. How to effectively monitor the quality of the network teaching needs us to construct a sophisticated online education evaluation system of adult higher education, including evaluation of student study, evaluation of teacher teaching and evaluation of network resources and operating environment.

With the development of multimedia technology, learning style for the adult higher education of computer network breaks the limits of traditional education and opens a new way for the adult students to accept the study of higher education, which guarantees the students can arrange their own study activity based on their own time; thus, the students' learning autonomy can be strengthened and the contradiction between the job and the study can also be solved. How to manage the resources of online education, effectively monitor the teachers' teaching and the students' study, manage the quality and construct the evaluation system of adult teaching quality based on online teaching is a problem that needs solving urgently.

Keywords: Adult higher education, Online education, System of teaching evaluation.

1 Construction Basis for Online Education Evaluation System of Adult Higher Education

Theory of systematic science starts from the integrity of things which holds the view that every internal factor of the system interrelates and influences with each other; there is also mutual effect and conditioning relations among the systems; system approach requires that every party of the whole and the structures, functions and methods that relate with each other need investigating; and relation between the whole and the part should be coordinated dynamically to achieve the optimum goal of the whole. Systematic science approach provides scientific theory for constructing online education evaluation system of adult higher education.

Online education of adult higher education of computer network is an organic unity which builds on the systematic science; every link of online education such

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as target location, the development and design of courses and process monitoring of teaching influences and supports each other; an all of them serve the quality of online education.

2 Construction Principle of Online Education Evaluation System of Adult Higher Education

Firstly: Target principle. The construction of online education evaluation system of adult higher education must center on professional training objective and talent training. Secondly: Objectivity principle. Evaluation system of online education should consider the requirements of its objectivity, i.e. the requirement of the student development, the requirement of the job market and the requirement of social progress. Thirdly: system policy: following law of cognition and education law, using systematic science method combining with major characteristics and based on the position, effect and interrelation of every link in the teaching activity, systematically construct the evaluation system of online education.

3 The Construction of Online Education Evaluation System of Adult Higher Education

Generally speaking, evaluation system of online education should include three parts: firstly, the evaluation on the students' study, which is main content of the evaluation system; the online education should pay attention to training the learning attitude of the students, monitoring and knowing well the students' learning progress and evaluating the study effect. secondly, the evaluation of the teachers' teaching is the basis to guarantee the quality for the online education of adult higher education; thirdly, the evaluation of network resources and operating environment is an evaluation to check whether the learning resources such as the courseware of online education offered by educators is rich, whether the operating environment of the network is smooth and whether it has sophisticated measures of technology support. These three subsystems are organic compositions of the whole online education and not a single one can be omitted. Their relations can be seen from Fig 1:

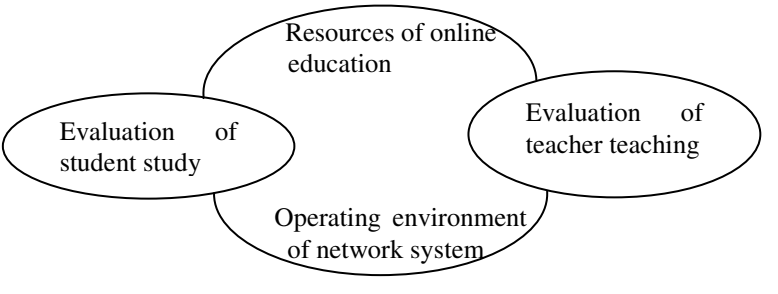

Fig. 1. Online education evaluation system of adult higher education

The following is the detailed explanation for the construction of the evaluation system of these three subsystems

Evaluation of Student Study. The evaluation of student study mainly includes the evaluation of learning process and evaluation of learning effect. In traditionally face to face teaching method, teacher is the arranger of teaching and the teacher can regulate and control the students based on the reactive information of classroom interaction. However, in the networked learning, the teacher is separated from the student; thus, in order to guarantee the stabilization and lasting of the student learning, the learning process of the student must be effectively monitored and evaluated and the evaluation system of learning process and learning effect should be built. It is shown in Table 1.

Table 1. Evaluation of the student study

Secondary index	Three-level index	Four-level index
Evaluation of learning progress	Learning attitude	Study time and frequency
	Job management	Submit the homework on time and guarantee the homework quality
	Interactive communication	Question frequency and quality; speaking times and quality of course discussion
	Resources utilization	Frequency, time and times of browsing the network resources and times of downloading the resources
Evaluation of learning effect	Level test	Test score at the completion of every unit
	Final exam	Test score at the completion of the course

Evaluation of Teacher Teaching. The evaluation of teacher teaching in the network education is various including the aspects such as teaching attitudes and methods of the teacher, teaching content, the offering of reference resources of online education, the student learning evaluation and the student evaluation for the teacher of this course. See Table 2 for the detail.

Evaluation of Network Resources and Operating Environment. Under the network environment, the transference of teaching resources is made by network; the evaluation supported by online education includes the evaluation of network resources and operating environment. Network resources refer to the resources provided by the network platform to check whether the system resource is rich and whether it can meet the teaching requirement of the teacher and student. E.g. whether the teaching accessory system can provide convenient teaching plan and course design module assist the teacher in completing the class organization and courseware manufacturing; whether the automatic learning system can provide effective resources, independent study and study tool of discussion; and whether the

system of answering questions can provide different kinds of channels for answering questions and store the reading. The operating environment of the network mainly refers to the system safety and the reliability and stability of the transmission system. For example, information encryption and backup of the student and offering support and guaranty for the stable operation of the teaching platform.

Table 2. Evaluation of teacher teaching

Secondary index	Three-level index
Teaching attitudes and methods	Online time and frequency
	Put forward customized suggestion to the student when correct the homework
	Carefully participate in answering questions
	Communicate the situation with the student
Teaching content and offering for the reference resources of the course	Select the teaching content carefully and update timely
	Combine theory and practical teaching
	Select proper teaching material
	The teaching orderliness is clear and the key point is obvious
	Offer reference data related with course study to the student to read
Teaching effect and student evaluation	Comprehensively analyze the learning effect of student of this course
	The student network evaluation for the teacher

4 Construction Strategies of Online Education Evaluation System of Adult Higher Education

Update the Idea and Explicit the Quality Goal of Online Education of Adult Higher Education. Online education of adult higher education is an effective way to achieve life-long education and life-long study; online education should reasonably arrange the major structure of the course based on the social requirement; online education should make preponderant subjects and special major of online education to realize the basis, practicability and epochal character of the online education and help the adult student solve the practical problems in the subject area and reality.

Develop Dynamic and Vivid Teaching Course of Online Education of Adult Higher Education. The courses development for the online education of adult higher education should be practical, nichetargeting and foreseeing based on the requirement of the social development and studying the development of this industry and the characteristics of adult student; meanwhile, it should be updated and completed at any time to make it rich and colorful and the students can learn what is needed and use what they learn. At the time, the courseware manufacturing of the course learning and the design of teaching content should timely adopt advanced manufacturing methods and innovative teaching methods.

Train and Construct Excellent Teams of Teaching and Teaching Management. The construction of teacher and teaching team is the key link to practically improve the teaching quality of online education of adult higher education. Online education of adult higher education mainly shows the automatic study and selective study of the student and the teacher isn't the core in the online education; however, the backman of the network platform is the orientor and director of the student; thus, a group of excellent teachers and an excellent teaching management team with high responsibility and rich experience of online education are urgently needed. The teacher's academic level, professional level and practical experience of online education should be improved and the teacher should be made regular teaching evaluation. Meanwhile, the network management level of the teaching administrators should be strengthened and the assistant work of online education should be done well.

Practically Improve Automatic Learning Ability of Adult Student. The training of the student' automatic learning ability is a core for improving the quality of online education of adult higher education. It is the basic work of the evaluation system of online education to activate the enthusiasm of the network learner and make the student develop automatic study effectively; otherwise, without the long-distance participation of the network learner, the improvement for the quality of online education is difficult to be effective no matter how perfect the evaluation system is. The educational ideal centralizing the student development should be further established. During the teaching practice for the online education of adult higher education that explores the guidance of the teacher and the learning autonomy of the student, what is important is enlighten the student and make them think to make the student who accepts online education can make exploration and practice of automatic learning.

Perfect the Supporting System of the Online Education and Optimize the Network Rescores and Environment. Stable supporting system of the network is an effective support for the teaching of adult higher education; rich system resources of network teaching including the platform of the online education, timely issuing the plan of professional teaching, and interaction and communication platform between the excellent teachers and student can also provide guaranty for improving the quality of the online education. Thus, the construction of the network environment should be further improved and the teaching material on the internet should be unceasingly enriched; the influence of the adult higher education on the

reform of the teaching methods and improving the teaching quality under the network environment.

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Overview of Service Orientation in Manufacturing Companies

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Abstract. Various manufacturing companies have developed service orientation strategies to improve their competitiveness and performance. But in fact, not all the companies implementing the service orientation strategies can be successful. The "service paradox" explains the phenomenon that substantial investment in developing the service orientation leads to increased service offerings and higher costs, but does not generate the expected correspondingly higher returns. Based on the research of literature about service orientation in manufacturing companies, the paper discusses the potential benefits(including potential financial benefits, marketing benefits and strategic benefits) and challenges (including negative effects, accounting service profits and Managerial motivation) about implementing this strategy in manufacturing companies and organizational arrangements or factors which can weaken or overcome the twitch of the process of extending the service business.

Keywords: Service orientation, Benefits, Challenges, Organizational factors, Manufacturing companies.

1 Introduction

Rapid technological changes, diminishing product life cycles, and fast time-to-market requirements pressure many manufacturers in their efforts to remain competitive [1,2]. Indeed, the manufacturing companies experience increasing difficulties in generating higher product turnover and maintaining technological superiority [3]. This seems to suggest that there could be an important shift to services in the manufacturing companies. Service orientation has become a central strategic concept in manufacturing. But in fact, not all the companies implementing the service orientation can be successful. The manufacturing companies make large investments in the development of services without generating return on them. Gebauer et al., (2005) named the phenomenon as service paradox [4]. In response to the service paradox, the manufacturing companies should know the potential benefits and challenges of delivering services, and organizational parameters which affect the implementation of service orientation of the manufacturing companies.

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2 The Benefits of Developing Services in the Manufacturing Companies

The potential advantages of implementing the service orientation can be summarized as following themes.

Financial Benefits. In the process of adding services to the tangible product to the total services providers, the company starts with a few product-related services and then end up with a large number of service offerings [5]. And then the profits and revenue of company are mainly generated from the company's core products to the services. Service orientation can make the firm's total offerings more unique, difficult to duplicate or imitate, and valuable to customers, which should improve firm value through higher and more stable sales, cash flows, and profits [6]. The sale of products is often a one off transactions, this situation causes fluctuation and uncertainties in the manufacturer's turnover. The sale of services, on the other hand, can follow a recurring pattern, through out the total product life cycle, services are a more stable source of revenue and substantial additional revenue can be generated from a high installed base of products [7]. Furthermore, services are suggested to offer higher profit margins than products, an increase in the service can compensate for decreasing product margins. The synergies between manufacturing and services, such as integrated solutions, can achieve cost advantages over its competitors by sharing resources. The resource spillover between product and service offerings can facilitate the complexity and causal ambiguity of its resource endowments, protecting them from imitation by competitors [8].

Marketing Benefits. According to the changes of the need of customers, more services are offered. The manufacturers should provide more services to meet customer increasing needs, cultivate customer loyalty, harvest the market opportunities. Marketing opportunities can be understood as ''better services for selling more products'' [9]. Increased service content typically requires increased customer–seller interaction levels to deliver the offering. With offering the products versus services, the relationship between the manufacturer and customer will be consolidate and strengthen. Strong relationships appear to be more effective for building customer loyalty and improve seller performance for service versus product offerings [10]. Augmenting tangible products with support services appears to increase both customer satisfaction and perceived product quality [11].Service creates higher customer loyalty, more pricing power, greater opportunities to cross- or up sell, and more cooperative customers, enhancing seller's ability to respond to changing environmental conditions, building superior customer equity[12,13].Providing services helps increase the value of customers and reinforce the company's image in other fields, such as product quality, technological advances.

Strategic Benefits. The company can gain the competitive differentiation advantages through the service orientation. Adding services to the products, the resource spillover between product and service offerings can facilitate the complexity and causal ambiguity of its resource endowments, protecting them from imitation by

competitors [8].Thus, neither offshore product-only competitors nor local service-only suppliers will be able to replicate the reciprocal spillover benefits and synergies of an integrated product/service provider. Furthermore, a service orientation strategy such as bundling product and service offerings supports manufacturing companies in building industry barriers to entry [14].

In fact, most manufacturing companies find it extremely difficult to exploit successfully the financial potential of an extended service business. Companies invest in service strategy without gaining expected corresponding returns. Gebauer (2005) termed this phenomenon the "service paradox in manufacturing companies.'' [4] Why several manufacturing companies often struggle or fail to exploit the benefits of developing service orientation strategy will be discussed in next section.

3 The Challenge of Developing Services in the Manufacturing Companies

Negative Effects. The strategy adding more services to tangible products maybe make negative effects on firm performance, such as loss of strategic focus and organizational conflict. According to the perspective of the RBV, organizational resources are limited. Spreading resources between products and services may decrease the input to the core product and manufacturing competencies [15].Manufacturer should balance the distribution of business resources between manufacturing and services and develop the core capabilities and competencies to compete effectively. As service and product businesses require different organizational processes, cultures, leadership, and structures [6,16]. Service orientation strategy may create internal confusion, even outright conflict[17].Such conflict generate series of problems, such as reducing employees' motivation, making configuration decisions and customer perceptions.

Accounting Service Profits. Manufacturers find it difficult to calculate the cost of service clearly. Services are poorly defined before offering, and are not part of the costs which can easily be calculated. Also the costs of services are borne by various support departments, often calculating in the fixed costs. Furthermore the cost accounting systems of most manufacturers are organized along product-based lines, companies cannot calculate costs that comprise both product and service cost components by customer or by market segment [18]. Many manufacturers in China push the whole-journey nanny service in order to increase the product sales and obtain competitivity, but competitivity does not equal to profitability.

Charging for services appears to be more confused than charging for products in manufacturing companies. Mathieu (2001) distinguished the services spreading in the manufacturing firms between two types: (1) services in support of the product (SSP) and (2) services in support of the client's actions (SSC) [19]. SSP can be easily duplicated, which are less specific, less customized and less knowledge intensive than SSC are. SSP can thus be identified as product failure preventers rather than product success producers [20]. SSC creates long-term relationships and gather specific information on current or future needs for manufactured products,

SSC resolve the problems faced with customers. In many industries, SSP become minimum requirements and free of charge or pricing standardized. SSC can be charged as part of a package comprising other services or products or separately.

Managerial Motivation. Gebauer(2005) suggest that decision makers will undertake the organizational move from product to service-dominant offering depending on overcoming the cognitive limitation associated with the disbelief in the potential of services to contribute significantly to the total revenue, disbelief in the attractive margins associated with services, risk aversion, overemphasis on obvious and tangible features of the environment. A failure to recognize the economic potential of extended service business and an overemphasis on tangible products belong to manager's cognitive phenomena limiting investment in services. Also the risk aversion of managers' in manufacturing companies maybe limit growth of service offerings. The overemphasis on tangible environmental characteristics, explains, for example, why managers do not place a high reward on extending the service business, limiting the investment of resources in the service area.

Manufacturing companies can overcome the above challenges and risks through building suitable organizational arrangements about services. Management experts and scholars have pay attention to the organizational factors in implement the service orientation strategy.

4 Organizational Factors in Service Orientation of Manufacturing Companies

Despite the above potential benefits or challenges for increasing service orientation in manufacturing companies, several organizational factors should be considered for implementing the service orientation successfully. There are four organizational factors to influence the implement the service orientation strategy: decision processes; organizational structures; human resources; measurement and rewards systems [21,22]. Gebauer et al.(2006) suggested that six organizational factors are called for extension service: marketing oriented service development and clearly defined service development process, service offering focusing on the value proposition to the customer, relationship marketing, definition of a service strategy, and establishment of a separate service organization[23]. Eric Fang et al., (2008) considered the service relatedness and resource slack in company. Service relatedness indicates the extent to which a manufacturer's service links to the core product. Resource slack refers to the cushion of excess resources that the company can use in a discretionary manner [15].They found that service orientation strategy(service transition strategy) are more effective at enhancing value when the service offerings are related more to the company's core business and when company have more available resources. Martin and Horne(1992) believed that develop new services systematically is necessary for the company[24]. While Bowen et al. (1989) research which organizational climate and culture is favorable to service orientation, they suggested a service-related climate and culture, such as marketing orientation culture, is positively associated with the service strategy [22].

Developing IT systems, performance tracking systems, efficiency improving and equipment, investments in unique skills, should be required to carry out service orientation strategy successfully. Michael Antioco et al.,(2008) conducted an empirical survey of 137 manufacturing companies in European countries, the researches consider the effects of organizational parameters on the implementation of service orientations[5]. Top management's commitment to and visionary leadership of services and service rewards are pure antecedents to service business orientations; Also, Donaldson (1995) believed that greater commitment to services is positively associated with the extension of the service business[25]. In order to achieve sufficient motivation, managers should believe in the potential benefits of service and know the risk of developing service.

In summary, manufacturing companies should promote the service culture and climate, such as customer orientation culture, work diligently and tirelessly to create superior customer value. Organizational arrangements should be adaptable to the service culture. Gebauer(2005) argue that the commonalities in the firms extending services successfully including the next six aspects: Establishing a market-oriented and clearly defined service development process; Focusing service offers on the value proposition to the customer; Initiating relationship marketing; Defining a clear service strategy; Establishing a separate service organization; Creating a service culture.

5 Conclusion

The development of organized and profitable services in manufacturing companies is not immediate. Oliva and Kallenberg (2003) propose that increasing the service orientation starts with the consolidation of the existing service offerings, continues with the entry in the installed base service market, the expansion to relationship and process-oriented services, and ends up with the taking-over of customer processes [26]. Service activities become profitable only when specific critical mass have been passed, both in terms of volume and of organization. Eric et al., (2008) find that the impact of service orientation strategy on firm value remains relatively flat or slightly negative until the firm reaches a critical mass of service sales (20%–30%), after which point they have an increasingly positive effect by evaluating secondary data pertaining to 477 publicly traded manufacturing firms during 1990–2005.

Implementing of services orientation strategy should keep in step with deliberate organizational arrangements. Only the companies understanding the challenges or risks and take appropriate means to solve them can triumph over the service strategy.

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Characteristics and Trends about China's Trade on Internet

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Abstract. China's trade on internet began in nineties of the twentieth century. From then to now, China's trade on internet has developed rapidly, which shows several characteristics and some trends. The characteristics are so excited that the paper has to say them firstly as follows: China's trade on internet whose trading volume increased every year has entered the period of large-scale development which is called technology-pull development mode. B2B, B2C and C2C are the three main kinds of transaction mode, while the integrate purchase burgeoned in 2010 and has being grown very fast. Under the situation, the trends of China's trade on internet to be coming include of new business modes, new untraditional netrentrepreneurs, new marketing modes and new financing channels and so on.

Keywords: China's Trade on Internet, Characteristic, Trend.

1 Introduction

Trade on internet means a kind of trade mode economy groups and individuals finish commodity product production, betterment, order, distribution and payment. In a word, trade on internet is one important kind of e-commerce. China's trade on internet began in nineties of the twentieth century. From then to now, China's trade on internet has developed from the age of enlightenment to the period of large-scale development and emerged more and more network trade mode. Then, what trends will China's trade on internet tend to? Based on those, the paper will discuss the characteristics and trends of China's trade on internet in order to offer references for the businesses, governments and so on.

2 The Characteristics of China's Trade on Internet

2.1 Technology-Pull Is the Main Development Mode

Trade on internet appeared and was accepted by people in the developed countries like America. In America, technical progress pushed the country to have a very advanced and developed supporting technology for trade on internet before the coming times of internet. A lot of forthgoers began to try trading on internet,

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which leads to network trade practice to present itself earlier than network trade concept. For another word, enterprise's business demand pushes the technical progress of internet and trade on internet and promotes the concept formation of internet and trade. Compared with America, network trade concept whose best torchbearer is IBM and other IT manufacturers appears earlier than network practice in China. Technical requirements for network and network trade pull enterprise's business demand continuously and then improve the practice and development of China's trade on internet. If it is called trade-push in America, it may be called technology-pull in China, which is the biggest difference of trade on internet between China and America.

2.2 Large Scale Developing Period Has Appeared

Until now, China's trade on internet has experienced three periods: firstly, enlightening period is from 1997 to 1998. The main participants are some IT manufactures and media who enlighten people to know trade on internet, like it and require it by electronic commerce in many ways.

The period from 1999 to 2000 is to popularize. The facilitators of trade on internet who are website became first batch of users of China's trade on internet and the main participants in the period.

The period from 2001 to today is the fast-growing time. With the deepening of application and development of trade on internet and the bursting of asset market bubble, the purely virtual trade on internet began to fall into low ebb. On the other hand, traditional enterprises began entering into trade on internet in a large scale and grew up to be a kind of new participant, which leads China's trade on internet to come into the fast material development period.

2.3 Trading Volume Is Increasing Greatly

The volume of China's trade on internet is increasing greatly. In 2001, the volume is only 55000 million. In 2003, the volume which broke 100000 million rapidly arrived 140000 million. In 2004, the volume which grew one times arrived 320000 million. In 2005, the volume which doubled continuously arrived 740000 million. And in 2006, the volume increased very fast and arrived 1.5 trillion. In 2007, the volume arrived 2.17 trillion and went up 90% than last year [1]. Until 2008, China's electronic business market volume arrived 4.5 trillion and gained 22% [2].

The reason why the volume increases fast is that the website and the number of netizen are rising greatly. The websit goes up from 90000 thousand to 98000 thousand. The amounts of China's netizen manifold ceaseless leave behind room for the volume of trade internet to increase more and more. For example, in 2010, the amounts of China's netizen which reached 457 million gained 73300 thousand than 2009, and coverage rate of internet which climbed to 34.3% increased 5.4 percentage point. In all kinds of internet application, the amounts of users of shopping online is 160 million and utilization ratio which upgraded to 35.1% jumped 7 percentage points [3].

2.4 B2B, B2C and C2C Are Three Main Trading Mode, While Integrate Purchase Is Rising

Trade on internet may be plotted out B2B, B2C, C2B, C2C, B2M, M2C, B2A (namely B2G), C2A (C2G) and so on. B2B, B2C and C2C are the three main leading trade modes. In the meanwhile, integrate purchase's market whose users reach to 18750 thousands in 2011 is so hate-sphere after rising in 2010.

B2B means business to business, namely electronic commerce (hereinafter EC) which means a kind of building up business relation between merchant and merchant. For example, the reason that we may buy Coca cola at Mcdonald's is the business relation between Mcdonald and Coca cola. The merchant constitutes business fellowships with other merchant in order to offer complementary commodity for them to grow together. B2B is the leading of China's trade on internet. Until 2010, the volume of B2B has reached 3.8 trillion which accounts for 84.8% of total volume of China's trade on internet and gains in 15.5% of year-on-year growth. B2B keeps a stable development momentum [2]. In B2B market, Alibaba will be the leading for a long times, the others share the residual market together.

B2C means business to consumer, namely EC of enterprise to individual which is the one a supplier supplies his commodity to a user directly. For example, what we have at Mcdonald's is B2C because we are just users of Mcdonald's. In 2010, B2C's volume reached 513100 million which amounts for near upon 3% of all-year volume of retail sales and is two double of 2009. Among of B2C website of independent distribution, JING Dong shopping center ranked the first which market share is 32.5%. With the 9 large-scale operating centers like Amazons being set up, over 500 thousand of commodities are supplied. The speed of Amazons' general merchandise development is over Dangdang far away, which has appeared in 2010 and its market share reached 9.2% over Dangdang's 8.9%. Following them, there is VANCL, Mac, Redbaby, Sunning, Newegg, Icson and so on [2].

C2C means consumer to consumer, namely EC of individual to individual, which is a customer to sell his goods in internet by himself. In C2C, the leading one is Taobao affiliated to Alibaba whose market share is the absolute leading one by 85.4%. Paipai, Icson follow Alibaba. Rakuten's market performance is very well depending on Baidu's great advantages like brand advantage and operating experience of Rakuten [2]. According to today's market status and consumer psychology, the above status will be kept during a long time. Although Paipai and Eachnet have entered the market, they will have little possibility to shake the leading Taobao.

3 The Trends of China's Trade on Internet

3.1 New Business Modes Are Arising

C2B and B2B2C are the two new modes of trade on internet [4]. C2B is advanced firstly by Yun MA who is the CEO of Alibaba. C2B is a kind of e-commerce about consumer to business or trading mechanics, which is concerned about

consumers' demand more than the others and influences the business modes and product production. C2B happens to have the same view with the consumer-oriented production mode.

B2B2C means business to business to consumer. The first *B* stands for generalized bargainors including of finished product, semi-manufactured goods and raw materials suppliers. The second *B* is on behalf of trading platform which offers the contacting platform between sellers and buyers and knight accessorial service. The *C* is the consumer. The business mode of B2B2C includes both of B2C and C2C. So B2B2C stresses more totalization and may offer knight more service than B2C and C2C. In B2B2C, the second *B* is the key because it needs to offer the information for suppliers and demanders. That is to say, the second *B* is the bridge to link the suppliers and demanders. Of that, the suppliers are mainly from amounts of medium-sized and small enterprises but not direct operational abilities among B2C. The demanders are the consumers who have the dependent requirements.

3.2 Netrentrepreneurs Are Turning into Diversification

Firstly, untraditional netrentrepreneurs like farmers are growing more and more, while traditional netrentrepreneurs increase their scales continuously. The farmers make use of network to sell their primary products, special local products and competitive products. In addition, more and more farmer netrentrepreneurs have become a kind of agency by the ways of promotion, drop shipping and manufacturing consignment. The most famous examples are Qinghe county of Hebei province, Yiwu city of Zhejiang province, Shaji town of Jiangsu province and so on.

Secondly, service is the leader of trade on internet. From 2009, service netrentrepreneurs have gradually become the leader of third-wave of netrentrepreneurs development. For examples, a series of living services like a flight reservation, booking a room, buying lottery and so on have been accepted by more and more people. With the development of living services, traditional service has begun to distribute their products online like insurance, tourism and so on.

Thirdly, facilitator groups of netrentrepreneurs are arising. Facilitator groups which are a set of groups offering the support for netrentrepreneurs like IT/ distribution channel, services, marketing and warehousing and logistics and so on may serve for the different netrentrepreneurs groups including of independent B2C websites, traditional brand enterprises, large bargainer, medium and small bargainers and so on. From second half of 2009, facilitator groups have been booming [5].

3.3 New Marketing Modes Will Be Innovated

Firstly, more and more medium-small enterprises which market their products by internet have realized the value of web-based marketing and inclined to increase their investment on it [5]. Affected by them, the others who have never taken part in web-based marketing will change their concept and follow them gradually.

Secondly, different customer demands need many netrentrepreneurs to innovate their marketing modes. Today, with consumption structure to be graded, consumption mode to be rebuilt and the generation after 80s and 90s to become the main consumers, customer demand make more growing differences. In the circumstance, netrentrepreneurs have to innovate their marketing modes by the ways of opening the platforms and self-serves to reduce the cost of meeting different customer demands. The best examples are the little bear electrical equipment, Shizhibao pillow and North America Sunshine [5].

3.4 Financing Channels Have Been Broadening

Different financial channels form different capital structures which will influence enterprises' profits. So we may say it is the key for the developing enterprises to finance by the different channels which include accumulating funds by business themselves, borrowing from financial institutions, non-financial institutions and other enterprises, financing with business, issuing financial bonds and stocks publicly all over the world and renting under the different circumstances. Every financing channel which has its advantages and disadvantages requires different financing conditions. So all websits of trade on internet should design their own financing channels carefully and confirm the best one according to their different development periods. That is to say, with the development of enterprises and the changing of circumstances, all websits should broaden their financing channels. Nowadays, issuing financial bonds and stocks publicly which belong to direct financing are beneficial to deploy capital rapidly and rationally and elevate their effectiveness is perhaps the best way. In China, there are several websits have listed in American such as Renren, Alibaba, Sina and Tencent (thereafter the Alibabas). This situation means China's websites already have a concept to broaden their financing channels and inspire more and more websites to imitate the Alibabas.

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The Application in the Game PBL Teaching

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Abstract. With the boom in recent years, teaching the game continue to emerge, we find that the game of teaching process in the specific implementation there were many problems that teaching effectiveness is not satisfactory. In the teaching process, through the ages, a lot of theory and practice have proved that the game has great value for learning. PBL as a new learning strategy, its development has been expanded to all areas of education, showing a huge momentum. This paper briefly describes the characteristics of PBL teaching method and its proposed based on the PBL and the game will be a combination of teaching strategies, in order to make up for deficiencies in the process of teaching the game.

Keywords: Teaching Games, PBL Teaching Practice, Application.

1 Introduction

By the China Game Publishers Association study conducted by the Commission recognized organization, the end of 2005, China's online games users has reached 26.34 million, of which, students accounted for 38.9%, has more than 1,000 people, and continues to grow in. Concentrated in the age of these users between the ages of 16 -30, 19 -22 years old accounted for 33.3%, 22 years old -25 years of age accounted for 28.4%, of which, 58.8% of people out of "pure entertainment" purposes.

Accordingly, the game is undoubtedly the favorite of students, the most willing to participate in an activity. In the teaching process, through the ages, a lot of game theory and practice have proved of great value for learning, but it is also worth our attention: in the specific implementation process, the effect of teaching the game and not always, therefore, We need to introduce an effective way to make the game to work with teaching practice.

2 Overview of Teaching the Game

German educator in Philadelphia • Fees • Bi Falcon Bill said: "To the children to actively learn, we learn something to get their kids play a camel, make the learning process once again become an interesting, fascinating experience, but also to create a successful experience for the children. [1]The game is teaching learners with fantasy (or imagination), experience in a certain space-time environment with

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the tools as an intermediary to the teaching purpose-driven, rules-oriented to compete, and receive feedback in an interactive activity system. Teaching is the game mentioned here refers specifically to the game will be used in formal school education and specialized classroom teaching, the educational and game play together to develop the game the user's knowledge, skills, intelligence, emotions, attitudes, and values.

Teaching activities according to the game occurred in different space environment, we will be teaching the game is divided into: teaching the game in reality and virtual environments in games teaching. In the real environment (in terms of the virtual environment is for) in order to play activities for the purpose of education in our regular classroom teaching has played an important role. In a virtual environment (PC machines, PS2 and PS3, NGC and XBOX and other electronic gaming devices for playing games to create the environment) in order to play activities for the purpose of education in China is still in its infancy stage.

3 The Application Status of Teaching the Game

American scholar Spiro (R.J. Spiro), who believes that knowledge can be divided into well-structured fields (well-structured domain) and non-well-structured knowledge domain (ill-structured domain) knowledge. The so-called well-structured knowledge in the field, is about a specific topic of the facts, concepts, rules and principles, they are in a certain hierarchy of organizations together. Well-structured knowledge in the field of non-main area of knowledge used in the field of well-structured context specific issues arising in the knowledge that the concept applied to the updating of knowledge.

Throughout the course content in different disciplines, which include a large number of well-structured knowledge in the field, because students understanding of basic concepts, and basic logical thinking ability, but the structure in areas of good students to master knowledge, pay greater attention to this knowledge in the context of specific issues, namely, the field of non-well-structured knowledge. Have any knowledge of the value of learning is to apply, no applications will be meaningless. In addition, course content is often a strong link exists between, and systematic. Such as: business change the nature of mathematics, the basic nature of scores than the basic nature of their essence is linked. Games teaching in the specific implementation process, taking into account the learning content are not any way to be used for games teaching, and teaching content for different game design must also pay attention to strategy, not abuse.

In the actual teaching process, teachers are using the principles of proper grasp of the game, the rational knowledge into teaching games to allow students to gain knowledge in the game, expanding the capacity? Many of the teaching cases that teaching the game did not apply to the teaching process to achieve the desired results, after analysis, I believe that such a problem mainly in the following five reasons:

The Teaching Game Design Is Not Clear Their Value

Teaching game design is the distinctive value of the game content to be closely linked to the focus and difficulty of teaching this lesson to the students the knowledge, skills acquisition, as well as the development of thinking of value, not all of the teaching content should carry games teaching. For example: Learn how to solve equations, such knowledge is the calculation of students, logical thinking ability, if by means of games, but perhaps even more conducive to teaching.

The Teaching Game Design without a Good Full Participation

Teaching game design is the way that full participation in teaching to make each student to actively participate in activities and games, go to the game character, for the process of experience. If only a small number of students to participate in games, most of the other students as the audience, then the games will become a mere formality, not really for the teaching service.

Knowledge of Teaching Game Design Defect in the Migration Considerations

Teaching game design is the knowledge of the migratory process in the game or the game ends, the lack of make the best use of teachers, guidance control, and timely migration, leading to lack of students reflect on the teaching content of the game is not conducive to knowledge transfer, leading to effective learning is not high.

Evaluations of Teaching Aspects of the Design of the Game Perfect

Mathematics teachers in the design process of the game, re-process, light results in teaching after the completion of teaching objectives is not to develop a precise evaluation of standards and evaluation methods over-simplification, the lack of comprehensive evaluation of the learning process, and students self-evaluation.

Teaching the game based on the above analysis, this paper presents a PBL and the game will be a combination of teaching methods of teaching, hoping to overcome the shortage of teaching the game, better reflects the value of teaching the game.

4 PBL Introduction

Problem Based Learning (Problem-Based Learning, referred to as PBL, also known as problem-based learning), originated in the 20th century, 50 years of medical education, has more than 60 medical schools in the promotion, fixed[2]. Now, more institutions to adopt this method of teaching or teaching reforms, including Education, Business, Engineering, etc. and a number of high school. 1969 by the American professor of neurology Barrows McMaster University in Canada, first, has become a more popular international teaching method.

PBL will learn the task or problem with the larger hooks, so that students put in question; it is designed authenticity of the task, emphasizing the study set to complex and meaningful problem situations, through the learner's self-exploration and

cooperation solve the problem, and to learn the science behind the problem of implicit knowledge in the form problem-solving skills and independent learning skills. Following is a brief look at the characteristics of PBL:

PBL Is a Learner-Centered Teaching Method

Learners in the PBL is the meaning of problem solving and the construction of those learners in the learning process is responsible for their own learning a sense of responsibility and self-learning content to achieve complete mastery of knowledge.

Based on PBL the Real-Life Situation

In PBL learning is based on the sprawling complex issues, these issues are every close to the real world or real scenarios. In PBL the problem must be challenging learners; learners can develop an effective problem-solving skill and advanced thinking. This would ensure that in future work and learning ability of learners to effectively migrate to the solution of practical problems.

PBL Is Based on the "Problem "as the Core of Learning

Mentioned above: According to the classification of different areas of knowledge can be divided into well-structured knowledge, expertise and non-well-structured knowledge. The PBL problems are based on non-well-structured knowledge in the field of knowledge. PBL problem set has a certain complexity, with many interrelated parts, each part is very important. Since the problem has some challenging, stimulating the enthusiasm of learners in the learning process and give full play to their autonomy, initiative and originality, encouraging them to continue to explore and learn. Therefore, PBL is based on the "problem" as the core of the learning process.

5 PBL Teaching Combined with the Game

Based on the above application on the status of teaching of the game, and the introduction of PBL and the characteristics of simple instructions, we can find, PBL learning concept advocated by the game and approach we use a lot of the same place, so this let us PBL produced wishing to combine teaching with the idea of teaching the game. Below, I will briefly introduce the PBL teaching the game of combining several advantages:

To Better Reflect the Value of Teaching the Use of the Game

Teaching the game to consider whether they have used in class value, mainly from the grasp of two aspects: first, whether the game allows students easy, enjoyable and effective access to knowledge; the second is whether the game can stimulate the students sensitivity and heart to positive thinking. [3] PBL is based on the core issues of teaching methods, teachers This method can be presented to students before doing a teaching course content meet the problem, and this problem should try its case in the game world is close, in order to attract students. Teaching the game is hidden in the knowledge of the contents of the task in the game, so the question should enable learners to gradually during the course of the game be

answered, eventually as the game ended, the learner can complete the final answers to questions to complete learning tasks to achieve teaching objectives.

Better Achieve the Full Participation of Games Teaching

Teaching in the game, for the full participation of the poor, we can learn from the PBL task to promote the collaboration features. Set the game has some problems and challenges of complexity, designed to take several students to participate in general work together to overcome difficulties the game to complete the learning content. As the game the difficulty of the task has a more stimulating enthusiasm for the learning, the whole class to form a temporary task force everyone to play their own sense of responsibility and autonomy, team members learn from each other to work together to solve the problem eventually complete the game task. During the course of the game, team members discuss with each other, learn from each other, so that the implementation process of teaching the game, the team collaborative learning with the advantages of individual self-study have been brought into full play, learning issues get discussed in the group supplemented argument, in individual studies to be deep reflection and mining. It can be said, the combination of the individual not only exercise capacity, and increased the participation of students and the collaborative spirit and consciousness [4].

Better Reorganization and Migration of Knowledge

In the past, teaching the game, when the end of the program, teachers lead students to reflect on the lack of knowledge is always the process of exploration and re-engineering of the knowledge structure of the learning process necessary, resulting in many learners are often completed in the game in the end cannot be learned exactly understand their What knowledge and how this knowledge to better the future with the practice. The PBL approach promoted after the completion of a problem to explore the issue should be a process of reflection. This process of reflection can help learners to refine their knowledge, and reflect on problem-solving process. Teaching during the game, we also need students to reflect on the entire course of the game is really clear understanding of their every step from secondary school to explore what it thought of the formation of advanced learners have a lot of help.. In addition to teaching but also promote the completion of PBL problems should be reported activity, which requires learners to use various forms of reported speech to report on their learning outcomes. Therefore, the use of PBL in teaching the game of teaching methods can promote better reflect the learner to explore their own learning process and summarizes the results of their own learning, so that the knowledge learned in the game more systematic and complete all, and so more for knowledge transfer in the completion of real-life situation.

More Diverse Forms of Evaluation

Scientific and reasonable way of evaluation is essential to the process of teaching a virtuous circle, because the game part of the teaching process evaluation of the imperfect, so I think we should learn from a variety of evaluation methods PBL. In the PBL teaching method, it is very important that students should evaluate their own information and information of others, to see how the information is obtained, the source is reliable, and this is an important way to promote independent

learning. Therefore, teaching in the PBL when combined with the game, every time the task group work after the completion of a game must be completed for each member of the group's task to evaluate the contribution, this evaluation not only promote better collaboration among group members and learning, but also to promote the teaching objectives are completed.

6 Summary

Games in education and proposed a new concept and teaching methods, and brings a new opportunity for development. It was on this game --- the opposite of education, with negative effects to transform things and apply it to the field of education. The PBL as a new learning strategy, its development has been expanded to all areas of education, showing a huge momentum. The two new teaching methods has its own advantages and disadvantages, is on the basis of this is the link between the proposed Combination of the two kinds of teaching strategies of teaching, hoping to avoid weaknesses, and ultimately achieve better teaching effect.

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The Study of Practical Teaching for Undergraduates Majored in Marketing

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Abstract. Practice ability of the undergraduates majored in Marketing plays an important role in the process of cultivating their employability. But in many colleges and universities, the practice teaching has been a weak link in the teaching, especially since the popularization of higher education, the community's voices about poor practical ability of undergraduates majored in Marketing has gotten more and more loudly. So it is necessary for colleges and universities to reform the practical teaching method. According to the rules of teaching reform, this paper proposes to transform the education concept, train double-qualified teachers, increase the investment on training base, strengthen the cooperation between school and enterprise, reform the practical teaching method to improve the practice ability of the undergraduates. So that it can provide beneficial reference for cultivating the practice ability of the undergraduates majored in Marketing.

Keywords: Practical teaching, Teaching reform, Practice ability, Teaching method.

1 Introduction

Along with the further development of Chinese economy and the acceleration of the pace of industrial restructuring, the requirement of graduates majored in Marketing gets more and more exigent. As a distribution center for cultivating talent----higher education, it must readjust its training subject, adapt to social development of the new requirements of Marketing talents and train a number of innovative spirit and practical ability of high-quality undergraduates. The Ministry of Education has also repeatedly stressed the need to further strengthen the colleges and universities of practice teaching, vigorously improve the students' practical ability. But the current practice teaching of China have emerged many problems, so that it is difficult to practice the students in a good level.

Since Marketing is a practical subject, it is very important for the undergraduates majored in Marketing to own practice ability. As we all know, the more practical training they do, the better they fit the job after they graduate from school. Therefore, the writer hopes that it can adapt to the new needs to the colleges and universities of practice teaching by the way of constructing a new practice teaching model, thereby improving the students' practical ability and nurturing their comprehensive quality.

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2 Characteristics of Practical Teaching

Practical teaching in colleges and universities has its own characteristics:

First, practical teaching aims improving the professional quality, rather than overall quality in general education. The practice teaching is a effective training way to train the students' actual operation ability, enhance innovation ability, promote the student to adapt the job requirement comprehensively after their graduation. Practical teaching also relates to the formation of students' operation skill, which will be the initiative capacity cornerstone of the students' employment practical ability, professional ability and innovation ability in the future. For this purpose, each practical teaching must have a clear goal to promote students' operation skill acording to the course. Therefore, each practical teaching can improve the students' professional quality, rather than overall quality.

Secondly, practical teaching is different from the theory teaching in the teaching form and teaching objective. Practical teaching shows its own unique features by open environment, systematic plan, dynamic content, flexible method and diverse evaluation which can't be offered by the theory teaching.Therefore, practical teachers must pay more attention on reforming the training pattern, which is important for students to study practical skills.

Finally, practical teaching has a more complex operation system than theory teaching. It includes part of many study systems, such as idea systems, content system, action system, resource system and so on. In the more specific level, it can also be divided into specific concept, target, curriculum, material, model, human capital, evaluation and cooperation. In the process of building a practical teaching system, some principles such as theoretical study combines with the skill learning, the software construction binds to the hardware construction, basic quality associates with professional quality, intramural practice joints with outside school practice must be complied, so that a good mechanism can be achieved.

3 The Current Status of Practical Teaching for Undergraduates Majored in Marketing

As the practice teaching is a weak link in the teaching, many colleges and universities have reformed edicational pattern for undergraduates majored in Marketing. In actual fact, the proportion of practice teaching is continuously increasing, and it is playing a more and more important role. At the same time, we must recognize that there are still some problems existing in practical teaching. The main problems are as follows:

3.1 The Practice Teaching Concept Has Not Set Up

Nowadays, the traditional teaching can not keep pace with the development of Marketing curriculum and can not meet the urgent need of innovative talents. But some teachers still fettered by the traditional teaching concept which placing theory teaching first, practical teaching second. They still take it for granted that

practical teaching is subordinate to theory teaching. Therefore, many teachers lay great stress on theory teaching instead of practical teaching. Preparing lessons halfheartedly and teaching practical skill only by word occur frequently.The phenomenon has limited the students' study enthusiasm.

3.2 Colleges and Universities Are Lack of Double-Qualified Teachers

The qualitiy ensurance of students' cultivation is a restriction to teaching staff. The core of college and university education is to build a high-quality teaching team. At present, the sources of practical teachers majored in Marketing are diverse. Many of them are still theory teachers. They are lack of practical experience and skill. So they can't meet the need of students' cultivation.

3.3 The Inputs on Practical Training Are Not Enough

Practical teaching is an important part of Marketing curriculums. But the inputs on practical training are not enough for students to train practice skill. This problem is mainly caused by the factor that the value and accessibility of practical knowledge had not been correctly recognized. Colleges and universities must set up practice centres and training base for students majored in Marketing to help them own practical ability and experience, so that they can find satisfactory jobs.

3.4 Cooperation between School and Enterprise Is Not Intensity

The practice ability is a compound concept. It contains many other abilities such as the practice ability, communication ability, team work ability and so on. So practice teaching isn't confined to in-school practice, but also includes out-of-school internships. Judging from the colleges and universities' situation, it is difficult to have a stable practice base, or to establish a company for actual Marketing. Because every enterprise and company pay more attention on profit, they can't provide practice base for free. Even if they provide a practice post, the post is not long-time one, students can't gain enough experience. Sometimes, students majored in Marketing have to practice in different enterprise or company dispersedly. Teachers can't instruct the practice promptly, so that the practice effect is reduced.

3.5 The Teaching Method Is Outmoded

At present, many practical teachers majored in Marketing aren't strict to their students, and they are careless about improving students' practical experience and skill. Their practice teaching method is solely. Some of them only show how to operate and scarcely let students operate by themselves. Even in out-of-school internships, some of the practical teachers consider that it is just a form. Therefore, the students majored in Marketing can't obtain the practical abilities.

4 The Proposition of Practical Teaching Reform for Undergraduates Majored in Marketing

With the constant improvement of social and employment mechanism, competition between graduates has become more and more fierce. Only guarantee the quality of practical teaching, can the vitality of a specialized subject continue, can we remain invincible in the fierce competition. In order to improve the quality of practical teaching, we must deepen the reform of training method, in particular, to strengthen the practice of teaching research and innovation. Therefore, we must recognize that pure traditional teaching has not been able to meet the needs of students majored in Marketing and the needs of the society. How to set up a new practical mode and enhance the quality of the practice teaching to improve the students' competition ability in employment is worth considering.

4.1 Transforming the Education Concept, Developing the Rational Teaching Objectives

In recent years, the undergraduates of Marketing grow rapidly in quantity, but the effective supply is inadequate. Because follow the traditional theory-based concept, it is difficult for undergraduates to meet the need of the market. Therefore, facing the current economic situation and educational training problems, colleges and universities must improve the training system in order to train the application-oriented talents to meet the market demand. They must set up a scientific concept and develop the rational teaching objectives according to education and the market's requirements, and then construct action-oriented curriculum system which based on the scientific analysis of professional quality.

4.2 Raising the Quality of Teachers, Training Double-Qualified Teachers

In more than a decade, double-quality teachers' construction mode plays an important role in undergraduate education. In order to raise the teachers' quality and train double-qualified teachers, we should import the talents to optimize teaching structure, export talents to combine with productive labor, invite the experts to focus on developing trend of professional techniques, stress training to increase effectiveness and make innovation to increase competitive ability. On the other hand, in order to construct a team of double-qualified teachers, experiment and practice is the foundation, demonstration teaching is the focal point, research and innovation is the direction, encouragement and guidance are the driving force. Therefore, increasing the fund for education, improving the condition of school operation and improving the teacher's working condition provides the necessary condition of material for constructing a team of double-qualified teachers.

4.3 Increasing the Investment on Training Base, Strengthening the Cooperation between School and Enterprise

Construction of training base is an indispensable premise and guarantee of training education. As Marketing is a application-oriented undergraduate majors, colleges and universities must face the following questions: "What kind of graduates we will train?" "How to train them?" "What quality of graduates we can train?" To answer these questions and to improve the graduates' quality, colleges and universities must construct training bases for students. And to accomplish this, there should be more investment channels to relive fund strains and accurate orientation should be the guide to develop training base construction.On the other hand, strengthening cooperation between school and enterprise can combine the theory and practical teaching. It accords with the talent training goal of students majored in Marketing. But with the rapid development of the economy, all enterprises conpete with each other in market aiming at maximum profit, they become unwilling to provide practice post to students. We can solve the problem through the means of combining learning with working and work-study program, which can give consideration to both improving the students' practical ability and gaining profit for enterprise.

4.4 Reforming the Teaching Methods, Using Modern Educational Technology

As we all know we can't achieve teaching optimization only by using theoretical classroom teaching methods, because the implementation of modern teaching means will be achieved both by teachers' theoretical classroom teaching and by using multimedia, electronic-teaching equipment and experiments, training operational capability and so on.We also can use the project teaching, case teaching and situational teaching to wake students learning interest and improve the teaching effectivenes. Teaching method of imitate Marketing can also be used to improve the students' skill: The teacher acts a customer while the students act salers. By means of showing Marketing process, the students can obtain the practical abilities they need.

5 Summary

As Marketing is a application-oriented undergraduate majors, colleges and universities must build up a new mode of talent training, with which we can cultivate the talents with innovative spirit and pioneering spirit. Obviously the traditional teaching of Marketing does not meet the students' needs for development. Therefore it is necessary to take social needs as an orientation, change training models of Marketing, cultivate application-oriented professionals who have abilities to solve practical problems. This research on practical teaching for undergraduates majored in Marketing can also serve local economic and social development by solving the

employment problem of college and university students and achieve the standard of working without adjustment period and of quasi employees.

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Engineering Graphics Implementation and Reflection on Teaching Quality Assurance

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Abstract. Engineering Graphics is a very important public engineering university foundation course. To ensure the quality of teaching engineering graphics, spatial imagination, students must be implemented to introduce the new era of knowledge engineering practice to master advanced computer graphics technology. Engineering graphics teaching quality assurance, must have quality teachers, there must be room for imagination and space to cultivate the idea of capacity, close ties with modern engineering practice and teaching of electronic technology. Deep concerns about quality of teaching engineering graphics course successors, engineering graphics teaching quality assurance is difficult to follow.Modern Engineering Graphics young teacher, in the projection principle, we should work hard. Innovative engineering design talent requires a higher graphics quality, the state should attach great importance to teaching engineering graphics quality assurance, so that it can be extended, so that the intangible heritage was inherited.

Keywords: Engineering graphics, Spatial imagination, Engineering practice, Computer graphics, Teaching quality assurance, Intangible heritage.

1 Introduction

Higher Education's mission is to cultivate creative talents. The ability of engineering colleges foster innovative engineering talent, these people must be innovative thinking, spatial thinking ability of the rich, rich practical knowledge of engineering to master advanced science and technology[1].

Engineering drawings of the engineering field are using the projection principle, follow the national standards, drawn with computer software. With the expression of engineering design drawings to guide the construction, technical exchange, the drawings referred to as engineering language. Engineering staff that the door works only mastered the language to express their design ideas. Thus, cultivating innovative engineering talent, should guarantee the quality of teaching engineering graphics, so that it has a higher graphics quality.

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2 Engineering Graphics Teaching Quality Assurance Implementation

Education is the process of creating the future, any thoughts of a discipline of education and educational processes of the discipline and significant impact on national development. Engineering Graphics is a very important public engineering university foundation course. To ensure the quality of teaching engineering graphics, spatial imagination, students must be implemented to introduce the new era of knowledge engineering practice to master advanced computer graphics technology. Engineering Graphics Teaching quality assurance for the future development of the engineering sector has an important influence.

Engineering Graphics Curriculum Educational Thought and the Process Is as Follows. First choice for tracking the times of the Students and practical knowledge and Electronics Engineering materials. The beginning of each semester requires the preparation of classroom teachers teaching under the syllabus calendar. The content of the implementation process of traditional teaching, the main requirements to writing on the blackboard. Emphasis on basic knowledge, basic knowledge of key speakers, more to say. Simple illustration, clarifying the principles and methods of mapping, legends Deep drawing steps concise and clear. Blackboard demonstrations, hands and brain training students, training students from the imitation of thinking to creative thinking. Above the main operating computer-aided drawing. Each class has a synchronized operation. Arrangements for each class to interact with students all the time, counsel students mapping and timely answers to the problems of students. End of the course, a full-house with the curriculum, with content, for exam classes when the students, the collective water marking and for binding paper analysis and sorting.

Provisions of the Ordinance the process of teaching a college, but more important is the education of teachers thinking is reflected.

Engineering Graphics Teaching Quality Characteristics

Quality Assurance Engineering Graphics one of the characteristics of teaching: choose the right materials or preparation of teaching materials

After investigation, experts help in the preparation of students for our institute to develop spatial imagination and spatial thinking capacity, close ties with modern engineering practice and teaching of electronic technology, materials characteristics are as follows:

Inherit the traditional content**.**Innovative engineering design talents need space for a rich imagination and the idea of space capabilities. Projection principle that "descriptive geometry", the course training people to the idea of spatial imaginationand spatial ability, the content is the classic content of engineering graphics, engineering graphics course is based, only have the ability to learn to study engineering, the content the latter part of the graphics. Therefore, the situation with our students and years of teaching experience, the preparation of the Anhui Provincial Planning college textbook "Descriptive Geometry"[2]. The book is characterized by re-basics focus on the basics of speaking, more to say. Easy to

understand, with simple illustrations, clarifying the principles and methods of mapping, legends implemented progressively. Legend more concise and clear mapping step, to self-learners convenience. Of the past and the content of the Detailed conducive to Picture stories, such as the combination of body part, explain the very detailed, to draw more complex form of axonometric drawing convenience, Picture stories to follow the course laid a good foundation Picture stories.

With modern engineering practice and the combination of advanced science and technology .Innovative engineering design knowledge and engineering practice professionals need advanced science and technology. Engineering practice knowledge refers to the new materials, new construction, new technologies, new national standards, the modern advanced technology means the application of computer and graphics software. "Architectural Drawing" highly practical content, and to keep pace with the times, the new materials, new construction, new technologies, new national standards embodied in the textbooks. Professional for our college as much as possible to meet the professional needs to set the "Architectural Drawing" book content. As part of the book is the construction of electrical power for the Students of our school is set up. Prospects for China's construction industry as well, for these students have the opportunity to go to the construction industry employment in the construction of electrical part of the design work of the previously published "Architectural Drawing " book, not the content - building electrical drawings. In order to better and modern engineering practice, we visited the Institute building, with an open mind to the knowledge of engineering practice to learn the rich old architect. But also to the old professor teaching experience to learn. Support in many ways, colleges and universities in Anhui Province has prepared the "Eleventh Five-Year" provincial planning materials, "Architectural Drawing"[3]. This book is characterized by colleges and universities follow the teaching of engineering graphics basic requirements, and the PRC Ministry of Construction released the national standard. Focus on the basics of drawing simple and clear steps, to self-learners convenience. Focus on engineering knowledge, and modern engineering practice, reflect the modern construction engineering, new materials, new technologies and new construction. The book includes the construction of basic professional engineering plans, such as building construction plans, structural drawings, architectural indoor water supply and drainage plans, construction electrical diagram. Tracking the modern advanced electronics, introduced the application of a typical AutoCAD drawing software.

Select appropriate materials or preparation of teaching materials is very important teaching.

Quality assurance of teaching engineering graphics features of the two: hands-on A typical computer-aided drawing of the teaching students the use of AutoCAD drawing software. Classroom teachers in terms of drawing commands are not used, but lead students to practice on the machine, in the engine room guidance. In the school room, a computer for each student, first started teaching students computer-aided mapping, that is on the computer, using mapping software can express their complete AutoCAD drawing a simple diagram, to complete a professional map, then draw on a computer Professional drawings.

Practical teaching environment as well, tracking modern advanced electronic technology, through hands-on grasp of the typical use of AutoCAD drawing software to enable students to meet the needs of the community. This is a very important practical teaching.

Quality assurance of teaching engineering graphics features three: the examination. The end of each semester course, required of teachers in the case of no leakage problems, the curriculum for teachers to use "intelligent vector graphics test database"[4], a collective volume. There is no standard answer to the test database, assigned by the Department of Teacher responsible for the answer, the teacher found the answer for the problem, immediately report to the Department of charge, for further processing. Complete answers to pay teachers for teaching and research head of audit, review any errors, pointed out errors, asking the right answer, and then modified by the classroom teachers, the standard answer after repeated modifications in shape, used for marking.

End of the course, with the college curriculum, with content, for exam classes when the students, the collective water marking, and for binding paper analysis and sorting.

When the teacher asked each marking score just, reasonable, non-discriminatory, this is a very important part of teaching management.

In short, engineering graphics teaching quality assurance implementation, Civil Engineering Student Book is their own teaching materials, machine class Student Book" Descriptive Geometry" with their own teaching materials, "Mechanical Drawing " series of selected materials, Dalian University of Technology [5] . Machine type with the construction of engineering graphics course, the actual operation on the machine with the examination process and the educational thought is the same, but the engineering knowledge and practice of professional engineering plans drawn by computer with different contents.

Teaching of Engineering Graphics Thinking of Quality Assurance

Engineering Graphics Is Difficult to Follow the Teaching Quality Assurance. Deep concerns about quality of teaching engineering graphics course successors, engineering graphics teaching quality assurance is difficult to follow. The main reasons are:

University executive management, not academic oriented [6], independent research and teaching assessment**.**Many college professors have mentioned scholarship, the above-mentioned "teaching of engineering graphics implementation of quality assurance, "is professor of administration and the embodiment of scholarship. However, different managers can be the same teaching process, while the educational thinking and the quality of education is not the same.

Aspects of the research projects of engineering graphics rare, hard to the results, the paper difficult to write, difficult to publish the article. Most teachers in engineering colleges of engineering graphics, engineering graphics non-graduates, he can make their own original research professional, a former professional papers.

Besides teaching and research leader and professor of administrative leadership is not only part of the thinking and education of the education process. Other aspects, such as year-end assessment they started going to school, just graduated as teachers. Therefore, university professors scholarship to be improved.

Engineering Graphics Course Comparison with other courses**.** Due to the current engineering college teachers, the majority of engineering graphics, engineering graphics non-graduates, although there are master's or doctoral degree, but they did not get better training in engineering graphics course. Few young people just to the podium to focus on thorough understanding of all the "Geometry" materials, in the projection method does not work hard on, but have learned that without access to.

In access to teaching hours, talk about other courses than engineering graphics course easy, so long as the other courses have class, very few people wholeheartedly about engineering graphics course. This course is the "descriptive geometry" part is difficult, the students attention, teacher preparation time and more duties include large, heavy burden.

These phenomena seriously affect the quality of university teaching engineering graphics guarantee. The current general lack of qualified engineering colleges of engineering graphics teacher.

The State Should Pay Attention to Teaching Engineering Graphics Followed for Quality Assurance. Innovative engineering design talent requires a higher quality of engineering graphics, engineering graphics teaching quality must be guaranteed, the state must attach great importance to teaching engineering graphics followed for quality assurance. If can do: Engineering attention from experts who follow the quality of engineering drawings. National education, conservation and engineering leadership succession in the engineering sector "non-material heritage".

Engineering of the "intangible heritage" refers to the teaching of engineering graphics quality assurance. At present levels of engineering colleges across the country, there is a group of experienced, dedicated his life energy to the engineering graphics educators, teaching of engineering graphics quality assurance checks by these people, this is a valuable engineering "non-material heritage. " National education, engineering leaders to give attention, to make these people really play pass, to help with the role of the Engineering Graphics Teaching quality assurance continuity, so that the intangible heritage was inherited.

National importance, the engineering graphics course can be followed to ensure quality of teaching.

3 Conclusion

Engineering graphics teaching quality to be guaranteed, there must be space for students can better imagination, practical knowledge of engineering time tracking technology, materials and electronics, focusing on computer-aided drawing hands-on, end of the course each semester for school exams .

A new era of young teachers of Engineering Graphics, the projection principle, we should make efforts to improve their spatial visualization and spatial thinking skills.

Countries should attach great importance to teaching engineering graphics quality assurance, so that it can be followed to make the intangible heritage was inherited.

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A Study on the of Application Blended Learning Theory in Practical Teaching of Program Design

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Abstract. The paper conducts observations, as well as experimental teachings on practical teaching of current computer programming course in the methods of observation, contrast experimentation, empirical research and interdisciplinary research. The results of data in the investigation indicate show that, to apply blended learning method in the practical teaching of computer programming, The basic model of practical teaching designed by blended program was constructed. It held that blending various disciplines and integrating several resources, such as schools cooperate with enterprises, will help to cultivate applied talents. The innovation of the paper is that it conducts in-depth teaching practice in the practical teaching of computer programming and comprehensively uses observation method, contrast experimentation method, empirical research method and interdisciplinary research method, and it constructs model for designing practical teaching through blended programming and applies the model to teaching practices, and verified its correctness.

Keywords: programming, practical teaching, blended learning, blended model.

1 Introduction

Programming is a main course for computer science and technology study. Through learning this course, the students are not only required to master high-level programming language knowledge, but more importantly need to gradually master the programming idea and method in practices, and to develop their application abilities of programming language in solving actual problems. Therefore, this is a distinctive course that focuses on developing students' innovative spirit and practical ability.

Currently, the teaching pattern mostly adopts single classroom teaching method and integrates some computer practices for consolidating knowledge points. This regular pattern is effective in teaching some basic knowledge, such as teaching basic grammars, structures, but as to the practical teaching of in-depth programming, it still has the following shortcomings: It cannot effectively stimulate students' initiatives,The practical effect is not obvious, resulting in students' being poor at designing programs by themselves,Neglects students' self-initiatives, which is not good for cultivating their innovation abilities.

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In order to improve the teaching quality of programming, scholars at home and abroad had tried case-driven teaching, which had improved the teaching effect to some degree, however, as most teachers had not much practical project experiences while computer technique is developing rapidly, many teacher who lacked practical project experiences could not get satisfying teaching results in case teaching.

Introducing the concept of blended learning into teaching program design can receive good teaching results.

2 An Overview of Blended Learning Concept

Blended learning is an integration of teaching and computer network under the guidance of dualistic thinking of teachers and students. It applies computer network to the traditional teaching progress, and focuses not only on learners' construct their knowledge by themselves, but also on the guiding role of teachers and synergistic effect of learning partners. [1] From the practical viewpoint, blended learning is not only a mingle of learning methods, but also a mingle of teaching resources, teaching models, teaching methods, teaching objectives, teaching media, teaching and work, "learning" and "practicing".

3 The Basic Model of Blended Programming Practice Teaching

In practice, the methods of observation, compared to the experimental, empirical research and interdisciplinary research are used to observe and for teaching in the practice teaching of programming course in computer science. The basic model of blended programming practice teaching is showed in figure 1.

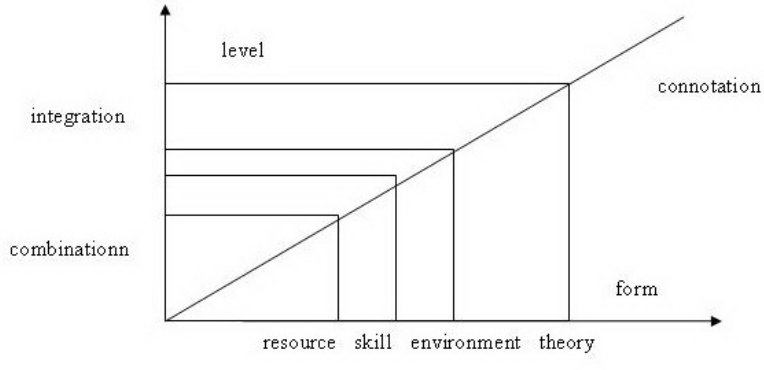

Fig. 1. the basic model of blended programming practice teaching

According to the analysis of abscissa, it concludes 4 blended aspects: resource, skill, environment and theory. From the analysis of ordinate, it contains 4 blended levels: combination, integration, cooperation and extention.It is clear that blended learning is a mixture of various learning resources, learning environments and learning theories. With further analysis, we can get 4 levels of blended learning.

Combination. Through integrating resources and building of the servicer of learning resources, we can get projects of programming development which are worked out by many university-enterprises to effectively resolve the bottleneck in experience shortage of teachers' practice development.

Integration and Conformity. This kind of blended learning method is to integrate types of learning methods into structural system of mutual-support learning method. It is nonlinear.

Cooperation and Coordination. "Learn without friends, the one will be ignorant and ill-informed." This proverb highlights the combination of learning methods and the cooperation among learners, especially in the development of large program, cooperation is more important.

Extention and Transcendence. Do creatively the effective education and learning for human's needs right time and right environment. It needs the great wisdom of teachers and learners. To cultivate a great programmer needs not only to construct his rigorous logical thinking, but also to develop his creative mind and inspiration.

Practice has proved that, the integrated teaching with multiple resources can get the multiplier effect.

4 The Implement of the Model of Blended Programming Practice Teaching

4.1 The Construction of Blended Learning

The exchange platform of programming training which bases on the blended learning theories. See figure 2.

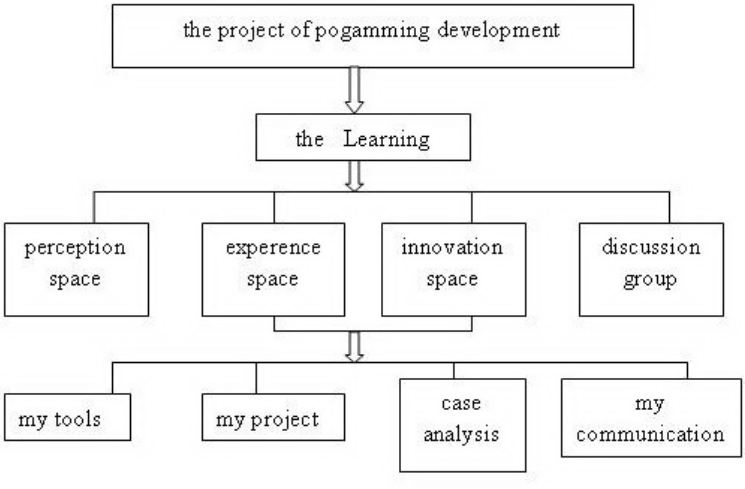

Fig. 2. the stuctue chat of blended pogramming pactice teaching

4.2 The Teaching Design of the Blended Concept

In the whole process of the blended practice teaching, it is emphasized that both teaching and learning can be conducted as activities with the learning activities as the centre.

The design of Learning ActivitiesMotivation for learners' learning and developing come from the interaction between the learners themselves and their learning environment. The development of the learners' cognitive function and the changes of their motion and attitudes are the structure of that interaction. From the learners' respect, the interaction itself is a learning activity. Therefore, the design of learning activities should be taken as the core of the teaching design.3 The learning activity is designed in the form of learning objectives, which include assignment objectives, research finding forms, activity contents, activity strategies and methods, to stimulate the learners' cognitive processing and their thinking and develop learners' mental function.

For example, in the teaching designing of the VC++ program, learning the "IF condition statements", the following activities are gaven: knowing a,b,c, if c is for a and b, then output 'right', otherwise output 'wrong', write the statement.

This question and its solution can be put in the experience space, then more similar questions can be reflected. If change the question to "knowing a,b,c, if c is the difference for a and b, then output 'right', otherwise output 'wrong' write the statement.

Then, the further exploration is to nest the conditional statements and iteration statements, and further step in adding the intelligent elements such as logical judgment into the practice of actual development. These activities are shown in the innovation space where learners can communicate and corporate with each other. Besides, the finished cases can be stored in the resources repository, offering the reference and examples for other learners as well as continuously richening the repository.

The Design of the Learning Environment

The design of the learning environment mainly is conducted as the integrating activity of learning resources and learning tools, as well as the teacher's coordination and work division with learners.

The Design of Media Communication

In learning the computer programming, it needs to keep on reviewing and consolidating to learn it better. The design of media communication includes teachers' teaching courseware, the design examples, the actual code collection from the large and medium software development company, learning videos etc. In the content of the entire combining teaching, the media communication is the most marginalized design activities.

4.3 Strategies of Learning and Teaching

This is a blended process of learning and teaching. Based on the requirement of the information technology and course integration, students are the main part of the teaching activities; the learning process centers in conducting self-exploration;

learners must negotiate and cooperate with each other; learning takes the problem or theme as the center; information technology is the major learning tool. Therefore, in the teaching and learning process, attentions should be paid to the following strategies: guide to build a favorable circumstance of question situation,guide to learn a better teamwork,conduct the timely evaluation and correction.

5 Evaluation of the Blended Teaching

5.1 Guidance for Learners to Conduct Self-evaluation

In the practice of the program developing, teacher should pay attention to students' knowledge, their skills in program developing, their emotions, attitudes, values and changes of the learning process and methods, as well as teamwork skill in program developing. Teachers can develop an observation chart to record the fulfillment of the assignment at every phase to help students achieve the objectiveness in the formative, summative assessment and diagnostic evaluation.

5.2 Evaluation of the Teaching Process

In the practice teaching, teacher can acquire the learners' suggestion on teaching process, gather the relevant information and data, keep on spotting the problems in teaching activities and modify them in time to enhance the efficiency of the teaching process and improve the learners' abilities.

6 Conclusion

Through the research finding lasted for one year, blended teaching is an effective teaching model, which break away the model of the single class teaching and perfect the teaching means. It has also helped to broaden the learners' horizon from the teaching contents, overcome the bottleneck of time within class, remove the space limitation, change their ways of receiving knowledge and realize the student-oriented independent learning, which is helpful for stimulating the learner's creation in computer programming.

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A Research on the Humanity Qualities of University Teachers

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Abstract. The humanity qualities of the university teachers affect the students overall quality of humanity. It is an important prerequisite and basis to carry out smoothly the current university students' quality education. Meanwhile, the literacy levels also have relations with the teachers' professional and technical aspects of the long-term development and future prospects. Overall, the current university teachers' humanity qualities have not been well with the new situation and needs of quality education. The colleges should change their minds to train the teachers by varied cultural activities of the channels to promote their humanity qualities as soon as possible. The teachers should also change their mind, teaching others and themselves the quality of education in practice, so as to improve their cultural literacy.

Keywords: Humanity Qualities, University Teachers, Qualities, Counter Measure.

The university teachers are the predominant of higher quality education, and the university students are the object. The humanity qualities of the teachers have a direct relation to higher quality education However, in recent years, especially since the higher up, our quality of university teachers is not getting better, the results of university education are rapidly decreasing, leading a large area of landslides. In spite of the hardware environment become excellent since the reform and opening, the software environment is getting worse on the other side. Remember that someone said, the university depends on the master and not building. The most important environment of the university is the quality university teachers. However, what's the current status of the teachers' qualities? What kind of qualities should they have? And what kinds of countermeasures should we take to improve the qualities of university teachers?

1 The Current Status of the Humanity Qualities of the University Teachers

"Humanity Qualities" is mainly refers to the professional knowledge and skills of other cultural and professional qualities. It is a man full of the integrated representation, it is not a tool to reason with a sound personality of an important line. In a

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rational personality, humanity qualities are not the "intellectual", which have no immediate practical effect. In fact, modern society tells that, a single instrumental reason can not form a healthy personality except making a big production "one dimensional man", leading the contract of the man's comprehensive and rich feelings. The survey found that our common of human knowledge not of optimism.

1.1 Human Knowledge Is Weak

In the investigation, we find that many teachers can not tell the difference between "natural" and "the social sciences" and they don't know much of "Humanities and Social Sciences .In addition to the professional knowledge and skills, they are deficient in social justice, human life and meaning, morality, and in esthetic tastes, and the ideal of culture, interest and understanding.

1.2 Traditional Culture Knowledge Is Weak

Profound knowledge of traditional culture is a great wealth of the intellectuals in China. Today's world is towards multi-polarity, cultural differences and diversity and more emphasis on culture, national culture, geography, culture and the country tried to be holding the flag. Many people appealed to the value of Chinese traditional culture and heritage resources. However, to be common knowledge in the traditional culture in general there are a deficient. Since the 20th century, the weak position in traditional culture has been made in china and scholars have not got the training of the fine traditional cultures.

1.3 Art Accomplishment Is Weak

The art of cultivation is an important part of the humanities, it is also a source of creativity. This is a world-class scientists can be tested. The Nobel prize winners, e.g. Yang Zhengning and Li Zhengdao have the high level of aesthetic knowledge. Their papers with very rich creative scientists rich inner feelings. This is a seamless integration of science and culture. The survey found, the higher the teacher was very fond of and appreciates fine art accounts for only 10% for 20%, while the teacher is very small contact and enjoy works of art. This fully demonstrates that the lack of art accomplishment.

2 The Significance of Improve the Humanity Qualities of the University Teachers

Improving the quality of the meaning of human knowledge is a healthy personality of the inevitable. Modern character and psychology tell us a sound personality should have both expertise and skills, and should include well in other culture. Many people could not realize this point, implementing rational as human nature. They plunged into an ocean of knowledge objectively, forgetting the purpose of knowledge and the value of life, and forgetting they and society are the other

reason. The tool is the modern philosophy and the scientific revolution, the reform of the human nature, is a powerful tool for personal and that the essential foundations. Similarly, humanity qualities are not lack, otherwise it will be the personality of a contract, for everyone, it is a misfortune.

2.1 The Humanity Qualities Are Required for the Quality Education

Now, to develop the creative talent, we are on a culture of quality education. However, students quality education, teacher is the dominant quality education. The teachers of the direct well conditioned to the success of the quality education. Commonly it is impossible to build up a contingent of high-caliber students if the teachers have no higher humanity qualities. The full meaning shall contain at least five aspects, knowledge and the development of intelligence, ability, and inspire motive, and personality. Example is better than words. if teachers teach in itself have nice humanity qualities, he is an example, a model, will be able to produce the effect.

2.2 The Humanity Qualities Are Necessary Conditions to Get Fine Teaching Results

In the view of the instrumental reason, the humanity qualities are not logic knowledge and have no functional use. In fact, the teaching process, human knowledge is also a positive element. Education is scientific and artistic. High standard of teaching should be scientific and artistic the organic combination of knowledge. it is difficult to produce a strong bow} force. The effects of appeal and the teachers and teaching of the knowledge flow of expression, and to study psychology of being close. Student not only ask the teacher to have a perfect knowledge structure and strong logic thinking, and also ask the teacher to have a good vocabulary and a good presentation skills and unique style .However, to get all of these, the only way is to be affected by the humanity qualities.

3 What Kinds of Qualities Should the University Teachers Have to Really Express and Improve the Software Environment? We Believe That the Following Five Qualities Should Not Be Missed

3.1 The Charm of the Reputable Character

As a university teachers and charisma is the most important qualities, but also to the trust and respect. As the factor of charisma come from truth and easy to distinguish right from the stand firm, from deep thinking, from the teacher highly thought of it. The university teachers in their teaching process, the analysis of natural and social process, in view of the people to demonstrate that the process will be conveyed to the students some of his own ideas of the information that

students will further consideration and decision and even will change the student's a decision, the decision is past and present and future. The teacher is a society in the leading groups and they represent a social conscience, pointing direction of young life, a nation in the future development of the track. They thought highly decided to a state of the future, they decided to a state of the future of their personalities determine the future generations, a nation's personality. Of noble nature and unsullied character should be no thought, this reason, not greedy for profit or benefit, and should be in conformity with the scientific truth, justice and fairness and maintaining social conscience and integrity, to keep in view of life and values.

3.2 The Deep Professional Quality

With the development of society, knowledge and technical areas, more and more, the university teachers in their specified field, have solid professional skill and abundant theoretical basis, and it is more important to get the capabilities to make the learning into natural, social and human. As the teacher's function is not only impart knowledge, the task is not only is learning to a heap of dead knowledge. The knowledge of the class into a form of thought, a natural tool for searching and social framework dialysis, a service to humankind happy, is teaching and learning is the ultimate goal. to achieve this, of course, the teacher to student, to give students a drop of water, and have a bucket of water. University teachers will not hear the ears, but read textbooks. the more rapid they fail to catch changes in social life, and therefore, the teacher must be concerned about it, society, nation and world affairs, the new knowledge, for his knowledge of the latest knowledge, will be charged to students, will the present and future tightly together.

3.3 Good Communicational Capacity

Teaching activities is not a one-way of social activity, but a two-way interpersonal activity. The power of expression, of course, is the most important power in exchange, with their knowledge and ideas of course, teachers use the language should be clear, accurate and fluent, humor, it is contagious, excited and inspire effort, to have thinking, logic and critically. Teachers and students in class, not only a language of communication and more important is the exchange and make eye contact, gesture of communication, which will only see the handouts, or sitting, balanced, the principals, there is no communication, of course, it's not teaching. Humorous language liven up lesson to attract the children's attention to interference from other matters. Therefore, a university teachers sense of humor is a classroom teaching and learning the key to success factor. A teacher liked by the students rarely is not a language teacher. A smile is more than a kind of fighting strength of every gram. Only in light of circumstances will quickly absorbed the information and the information, and memory the information will be involved in the desire, without the involvement of teaching activities will never achieve satisfactory results.

3.4 Broad Knowledge Reserves

The teacher is a part of the profession, not a monk chanted sutras turned the microphone. A single only understand their professional knowledge is not likely to become a qualified teacher. a university teaching astrophysical of the teachers don't understand philosophy is a hard to imagine that a lecture on art course of the teachers don't understand mathematical principles is also a weird experience. A civil engineering professional college teachers do not have the knowledge of physics, as a history of university teachers don't understand the study, can't find the civil engineering study the structure and physics, i don't find in history and learn the relationship between the longest. An environment of the design of the university, if he does not understand the psychology he will not find the design of the essence. Such circumstances, a university teachers simply know own professional knowledge, it would be impossible to use all kinds of knowledge to make the lessons impressed and charming. Therefore, as a teacher, such as a college teaches economics teacher, in addition to the professional knowledge, should be at least crude to understand many other subjects, including political science, mathematics, psychology and sociology, aesthetic, philosophy, history, etc.

3.5 The Enthusiasm of Dedication to the Cause

Teacher the name means more than a profession, it means a cause. a teacher will not work as a means of sustenance, work is not only to ease the basic wages and cost of the classes. Some teachers have many classes a week, they could not have time to prepare our lessons carefully and think the students and teaching thinking and earnestly correcting the exercises, seriously rethink their teaching and improved. They have to their teaching in a totally numb, even if they wanted to do well, it is impossible for the time and energy. For teachers of this kind of job with enthusiasm, is not the cause of the many classes to earn more money for the warm, and should be the cause of all the passion souls. the passion of the result is for the professional of study, the teaching of study, to teaching the object of study, to teaching results of study, the method of study and teaching style.

4 The Countermeasures to Improve the Humanity Qualities of the University Teachers

Against the common teachers of poor quality of the situation, we should put forward some countermeasures, but the increase is a systemic project and the need for a long time. Presently, the following points should be done mainly.

4.1 Changing Our Mind, We Know Well the Importance of the Humanity Qualities of the University Teachers

According to our analysis, the major cause of the poor qualities is subjective neglect. From the education concepts, whether a university or a teacher is a kind of

indifference to humanities. Therefore, to enhance teachers' qualities, we still have to change ideas from the roots of the university. It is the key to get a good quality education to raise the quality of teachers and it is also in response to the state of quality education policy.

4.2 Intensive Management, Training of Teachers and the Development of the Humanistic Approach

University is an organization under the education sector, it is a lot of things in the management. To enhance teachers' well, we should improve management, training, especially the construction of teachers should be combined to make. For a long time, the construction of the teachers in colleges of education is an important part of the management work. We have successfully built up a set of effective theory and methods.

4.3 Letting Teaching and Learning Help Each Other and Organize Kinds of Human Activity

Generally speaking, owing to time and effort, the university teachers are very difficult to take out the whole time devoted to improve their humanity qualities. Therefore, we advocate the teachers to teach while learn to improve their qualities. When the teacher is preparing teaching content he should expand the teaching materials, actively exploring the integrated approach to connect the expertise with the knowledge of humanities. Without prejudice to the professional knowledge, the teachers will force students to think professional knowledge of the social life. Thus, smoothly, the humanities of the teachers can also be increased. Of course, in addition, schools can organize the teacher's good humanities education activities and organize some of the cultural societies, to attract more teachers active participation.

5 The Closing

University teachers and students humanity qualities are connected with the overall quality of humanity, the current university students quality education is carried out smoothly is an important prerequisite and basis, the college of literacy levels of relations with the teacher is a professional and technical aspects of the long-term development and future prospects. University teachers' humanity qualities have a long history and culture and traditions of origin. But today the university campus some unhealthy phenomena, the university teachers' qualities exist problems and shortcomings. The problem has something with the teacher's personal background, with a history and reality, and with social and economic aspects of the deep consideration. Of course, the issue of improving, is not a simple process, but a view to effectively solve these problems, the need for institutional reform and improve university teachers, too, needing its own awakening and self promotion, which needs to be a long-term process, the practice process of exploration and improvement.

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Study on Effective Assessment of Practical Teaching in University Based on IPA

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Abstract. This study presents estimates of student's expectations and actual harvest for practical teaching based on IPA. In effective assessment process of college practical teaching link, concrete understanding and deviation between teachers and students were obtained and analyzed. It plays an important part to improve teaching quality and communication effects. Assessment is performed to understand effect of undergraduate production practice sessions for civil engineering in Shijiazhuang Tiedao University by means of IPA. Not only is the emphasis on this production practice placed, but it can be as reference for improving its strategy, particularly in terms of maintenance, excessive behavior, no priority, and improving the focus.

Keywords: IPA assessment, University, Practical teaching, Shijiazhang Tiedao University.

1 Introduction

Proposed obviously in the 11th Five-year Plan for National Economic and Social Development of PRC, emphasis on the development of higher education is to improve quality and optimize its structure, strengthen the research and practice, and innovative student's spirit and practical ability. Practical teaching is taken as an essential part in higher education system, which is paramount to improve their practice and innovation.

A considerable amount of research has been carried out on the topic of practical teaching. In connection with papers statistics in China National Knowledge Infrastructure, the number of papers has increased up to 41.9% in average per year from 2001 to 2009. It is noted that more and more attention has been paid to practical teaching in university. At present, a lot of research work has been done for it, and many fruits have been presented, which is mainly in certain fields, such as system [1,2], model [3], quality [4,5], domestic and foreign institutions [6,7], high vocational-technical professional [8,9] and so on. However, these studies do not provide much attention to effective assessment of practical teaching in university based on perception of teaching subject and satisfaction.

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2 Research Method

2.1 IPA Assessment

Importance-Performance Analysis was proposed by Martilla and James at the first time, which is called IPA for short. It was used for performance analysis of car dealer and generally known as analysis management technology with low cost and easy understanding. In order to draw a two-dimensional four-quadrant square graph, median of average or population mean about importance and performance was used as coordinate crossing point. Namely, importance is deemed for longitudinal axis, and performance for lateral axis. Importance in first quadrant is high, and performance is significant, which is called maintenance region. Importance in second quadrant is low, and performance is also significant, which is called excessive behavior region. Importance in third quadrant is low, and performance is not good accordingly, which is called no priority region. Importance in fourth quadrant is obvious, and performance is low unfortunately, which is called improving focus region.

At present, IPA assessment has been used for service industry, medical marketing, leisure entertainment, exhibition, restaurant, and tourism [10] and generally known as an important tool to improve customer satisfaction and optimize service quality. In connection with subject of higher education, namely student group, practical teaching effects is evaluated by means of test and analysis. We attempt to use IPA for effective assessment of practical teaching in university, in order to make goal of practical teaching in university more specific. It is noted that coordinate of IPA assessment was compared and presented as shown in Fig.1.

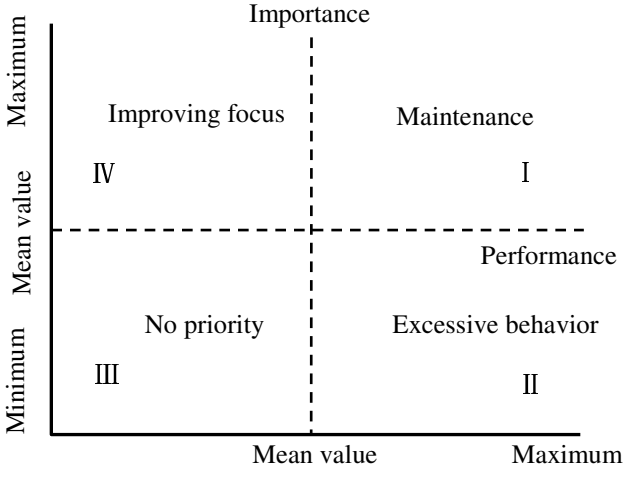

Fig. 1. Coordinate graph based on IPA assessment.

2.2 Investigation Situation

The object of survey is undergraduate specialty of civil engineering in Shijiazhuang Tiedao University, including 149 junior students. Shijiazhuang Tiedao University is domestic famous technical university. In teams of engineering specialty, synthetic model is used for assessment of practical teaching, such as course design, experiments curriculum, graduation project, cognition practice, production practice, graduation practice.

2.3 Design for Questionnaire

Questionnaire is composed of three parts. At first place, it is about true or false, which is used for survey understanding of practical cognition and degree of readiness of practice. Secondly, 13 evaluating variables of practice link are enumerated to investigate process and methods of practical teaching, interaction between teachers and students in practice process, enthusiasm of individual participation, application of theoretical knowledge, harvests of practical teaching. To evaluate enthusiasm of individual participation, variables of student's self-evaluation at earlier stage and practice performance at later stage are discussed. 13 evaluating variables are selected successfully, as a result of consulting thirteen teachers of tunnel and underground engineering in civil engineering specialty, who constitute national level teaching groups at Shijiazhuang Tiedao University. Similarly, content validity was identified to ensure the questionnaire overall and effective. At last, investigation results have been summarized.

In order to clarify intention of investigation during questionnaire, connotation in 13 evaluating variables are interpreted for students, summarized in Table 1. Variables were score quantitatively by Likert five scales. For instance, 1 indicates very unimportant, and 5 for extremely important. The purpose is to reflect expectation of the nature of practical teaching and process for practical teaching subjects. In other words, it shows degree of importance in terms of each variable of observation. In addition, 12 perceived performances for practical teaching were evaluated from 1 to 5. Moreover, 1 represents very good, 5 for very bad. The third part data mainly is about student's evaluation of practical teaching from tutor, including enthusiasm of practice, and quality of the internship report submitted. So enthusiasm of individual participation was analyzed by the third part data.

There were 149 questionnaires, of which 142 have been retrieved. In addition, 140 questionnaires have features with questions answered completely. It met sample requirements and the eligible rate was 94%.

Table 1. Connotation analysis of survey variable.

Variable	Connotation
Combination with theoretical knowledge	Investigating cohesion for practical teaching, theory and course learning
Correlation of practice at earlier stage	Investigating cognitive effect of student induced by experience of practice at earlier stage
Guidance and mobilization at earlier stage	Investigating cognitive effect of practice subject by guidance at earlier stage
Improving itself ability and quality	Investigating demand ability cognition of practice process by practice subject
Vividness of practical process	Investigating practical process flexibility and interest in process of practical teaching
Details of practice plan	Investigating rich degree of practice content and comprehensiveness of plan
Coherence of practical process	Investigating integrity degree and joining content in practice process
Interaction between teachers and students in practice process	Investigating exchange and interaction between teachers and students
Choice of practice location	Investigating scale of practice location and goodness of fit with the object of practice
Arrangement of practice time	Investigating practice time effect of length and date
Working attitude of adivisers	Investigating responsible degree of tutor and other participation people.
Enthusiasm of individual participation	Investigating enthusiasm of subject for practical teaching
Obvious effect of practice	Investigating professional knowledge of practice subject and improvement of practical ability

3 Results of Data Analysis

3.1 Investigating Cognition and Willingness for Link of Practical Teaching

Survey questions included main form of practical teaching link, which was chosen with special regard to personal opinion. This type of exercise was multiple-choice. 75 percents of respondents deemed that practical teaching link should include training, and 64.3 percents think that it should include experiments. Internships accounted for 55 percents. Course design accounted for 38.6 percents. Graduation project accounted for 21.4 percents. Furthermore, 32.9 percents of students held that practical teaching link should include extracurricular activities and technique contest.

In this investigation of practice willingness, 98 percents of students expressed great interest in practical process. At the same time, 81.4 percents of students have look up related information at earlier practical stage. 81.4 percents of students have normally exchanged with classmates.

As a consequence, overall survey results indicated that students did not fully understand practical teaching. Nevertheless, they expressed strong participative interest and enthusiasm.

3.2 Cognition and Performance of Effective Evaluation Variables for Practical Teaching

Based on investigation, students deemed that responsible attitude of tutor and relevant instructor was most important in practical teaching. Moreover, the order of importance was list as guidance and mobilization at earlier stage, improving itself ability and quality, enthusiasm of individual participation, obvious effect of practice, interaction between teachers and students in practice process, coherence of practical process, arrangement of practice time, choice of practice location, vividness of practical process, details of practice plan, combination with theoretical knowledge, correlation of practice at earlier stage. Performance assessment demonstrates that working attitude of advisers was most satisfying to students, and then, the order was improving itself ability and quality, guidance and mobilization at earlier stage, choice of practice location, interaction between teachers and students in practice process, arrangement of practice time. What's more, concrete mean value, standard deviation and ranking are presented in Table 2. There was great difference for ranking of importance and satisfaction due to different choice of practice location, of which the ranking was the ninth in importance, and fourth in satisfaction. The enthusiasm ranking of individual participation was the fourth in importance, and thirteenth in satisfaction. Generally speaking, choice of practical teaching location is comparatively successful. In terms of enthusiasm of individual participation, students have recognized its importance. Instead, teacher deemed that student enthusiasm did not meet their requirements.

Table 2. Importance and satisfaction of effective evaluation variables for practical teaching.

Variable	Importance			Satisfaction		
	Mean value	Standard deviation	Ranking	Mean value	Standard deviation	Ranking
A. Combination with theoretical knowledge	3.60	1.06	12	3.53	1.12	11
B. Correlation of practice at earlier stage	3.49	1.04	13	3.41	1.07	12
C. Guidance and mobilization at earlier stag	3.95	1.05	2	3.87	1.08	3
D. Improving itself ability and quality	3.95	1.03	2	3.89	1.10	2
E. Vividness of practical process	3.67	1.01	10	3.65	1.02	8
F. Details of practice plan	3.66	1.04	11	3.62	1.05	10
G. Coherence of practical process	3.78	1.13	7	3.64	1.13	9
H interaction between teachers and students in practice process	3.79	0.99	6	3.77	1.05	5
I. Choice of practice location	3.75	1.10	9	3.86	2.72	4
J. Arrangement of practice time	3.77	1.14	8	3.74	1.20	6
K. working attitude of adivisers	4.12	1.05	1	4.02	1.10	1
L. Enthusiasm of individual participation	3.89	1.00	4	3.29	0.55	13
M. Obvious effect of practice	3.83	0.94	5	3.70	1.10	7

4 IPA Analysis of Practical Teaching Effects Based on Subject

The maximum of importance mean value for each variable was 4.12. And the minimum was 3.49, median value 3.81. In addition, the maximum of satisfaction was 4.02. The minimum was 3.29, median value 3.66. IPA coordinate graph was carried out as given in Fig.2.

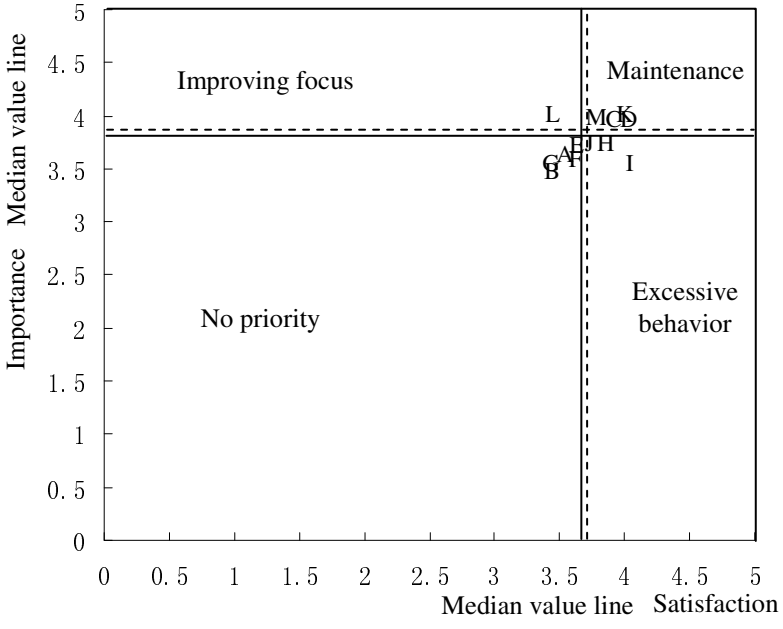

Fig. 2. IPA analysis of student's perception for practical teaching effects.

Fig.2 presents the results for IPA analysis of practical teaching effects. In first quadrant, four variables are very important to practical teaching, such as guidance and mobilization at earlier stage, improving itself ability and quality, working attitude of advisers, obvious effect of practice, which were fit to performance and should be maintained. In second quadrant, three variables were very important to practical teaching, such as interaction between teachers and students in practice process, choice of practice location, arrangement of practice time, which was excessive behavior and its effect exceeded expectation. In third quadrant, the performance of five variables were general to practical teaching, such as combination with theoretical knowledge, correlation of practice at earlier stage, vividness of practical process, details of practice plan, coherence of practical process. What's more, it is not the emphasis on practical process and practical training link. Survey results identified that student paid no attention to the five variables, compared with other variable. Unfortunately, to make teaching effect more comprehensive, education management and tutor should pay more attention to them in actual practical teaching link. In fourth quadrant, enthusiasm of individual participation should be improving emphasis. Although students were convinced of importance of individual participation enthusiasm, tutor deemed that their enthusiasm was not enough from view of student's participation process and comprehensive evaluation submitted by student. So it should be strengthened. Comprehensive effect of the practical teaching was nearly the same as expectation of student in the practical teaching. Hence, students felt satisfied and sense of achievement.

5 Conclusions

In link of college practical teaching, students should be as subject to improve themselves practical ability and creative ability. With the aim to make practical teaching effect more clarifying and purposeful, demand and willing of students should be paid more attention on effective assessment of practical teaching. IPA assessment is easy to understand and operate. Each variable of observation was evaluated in practical teaching link by means of IPA. Moreover, IPA was fit to finding out question purposefully, such as concrete understanding and deviation between teachers and students. It plays an important part to improve teaching quality and communication effects.

IPA assessment is used for practical teaching for the first time in this paper. Whereas, concrete researched process needs to be further study. To begin up, choice of variable is not accurate, and should be further refinement. In addition, effective assessment of practical teaching only depends on perception of students. On the whole, effective assessment of practical teaching need to be further improved combining with teaching model and psychology of practical subject.

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Job Burnout of University Administrators and Teachers and Its Protective Factors

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Abstract. This study attempts to explore job burnout of university administrators and teaching faculties and its protective factors. The author conducted a survey of 240 university administrative personnel and 350 university teachers by using the modified Chinese version of Maslach Burnout Inventory–Educators Survey (MBI-ES), Self Consistency and Congruence Survey (SCCS), and Interpersonal Trust Survey. The survey shows that the job burnout level of administrative personnel is significantly lower than that of teaching faculties ($p1<.001$), while their scores in self consistency and congruence and interpersonal trust is much higher than that of teaching faculties($p2<.001$, $p3<.001$). Self consistency and interpersonal trust, as protective factors, function differently in these two groups. For university administrators, interpersonal trust which is the primary influencing factor of job burnout and self inconsistency is the minor influencing factor; while for teachers, things are just the opposite.

Keywords: job burnout, self consistency, interpersonal trust, university administrators, university teachers.

1 Introduction

The problem of teacher burnout is a widespread concern in the fields of both education and psychology.[1]. Previous studies always treated university staff as a whole, which can actually be divided into subgroups such as administrators and teaching faculties according to their different division of labor. A survey showed that as professional administrators in highly specialized organizations as universities administrators' work burnout was different from both general managerial personnel in other fields and university teachers as well. [2].

Previous studies show that there are many causes leading to teachers' job burnout, of which some are related to their profession and social environment and some are related to their individual factors such as interpersonal relationship[3]. In some aspect, is there difference between the job burnout of these two groups? Is there any protective effect of personality which is a internal factor and interpersonal relationship which is an external factor for both groups against job burnout? These are problems still worthy of study.

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So this study takes university administrators and university teachers as its research subjects and analyse their work burnout levels and the relationship of work burnout level and self consistency and interpersonal trust. Providing psychological basis for a better understanding, prevention and precaution of university administrators and teachers' job burnout from the perspective of self harmony and interpersonal relationship.

2 Subjects and Method

2.1 Subjects

Using stratified sampling carried out in the city of Wenzhou, Hangzhou, Ningbo, Jinhua and Zhoushan of Zhejiang province , the study surveyed 240 university administrators of which 198 are valid subjects, 165 males, 33 females, mean age (28.04±5.45) years, and 350 university teachers, of which 302 are valid subjects, 52 males, 250 females, mean age (36.93±5.36) years.

2.2 Tools

2.2.1 The Teacher Burnout Scale

This study takes as its research tool the Chinese version [4].of Maslach questionnaires (MBI-ES) adapted by professor Lu Jiamei, which consists of three factors with a total of 25 questions using the five points scoring method (from "never true" to "always so "). The questionnaire's internal consistency coefficient (α) is 0.82 and "emotional exhaustion" factor is 0.86, "personality disintegration" factor is 0.80, "achievement" factor is 0.79, and its credibility is good.

2.2.2 Self Scale (SCCS)

This scale is prepared by Professor Wang Dengfeng which includes three factors — disharmony, inflexibility and rigidity with 35 questions using the 5 points scoring method (from "completely consistent" to "completely inconsistent"). The reliability value is high. (α value is between 0.64 and 0.85). [5].

2.2.3 Interpersonal Trust Scale

This scale is adapted by Professor Zhang Jianxin according to Rotter's Interpersonal Trust Scale[6], with 22 questions using the 5-points scoring method (from "totally disagree" to "totally agree"). The questionnaire's internal consistency coefficient is 0.82.

2.2.4 Demographic Variables

The study examined a population of 8 demographic variables: the identity of the subjects (university administrators, university teachers), the subjects' sex, age,

seniority, education (college and below, undergraduate, master's and above), income, students' grade (middle or high schools), urban and rural differences.

2.2.5 Statistics and Data Processing

This study makes use of Spss 11.5 software package for analysis.

3 Research Results and Analysis

3.1 Group Variance of Work Burnout of Administrators and Teachers

Taking the subjects' identity as the group variable and the other 7 demographic variable as covariate variables, this study makes a multivariate analysis of covariance of the relationship between work burnout, self disharmony and interpersonal trust. The result is shown in table 1. There is difference between university administrators and university teachers in all the three dimensions. The work burnout level of teachers is clearly above that of administrators, and it is mainly manifested in the lack of sense of achievement. In terms of self disharmony and interpersonal trust, university administrators are better than teachers. But with regard to rigidity, there is no difference between these two groups.

There is also some difference between the sexes. For the teachers group, male teachers' work burnout level is higher than that of female teachers; for administrators, female administrators' work burnout level is higher that that of male administrators and their self harmony and interpersonal trust are lower than that of male administrators.

Table 1. Variance test of university administrators and teachers on the 9 variables in the three dimensions

Variables	administrators		regular teachers		*F* values	Gender Identity(*F* values)
	M	SD	M	SD		
Emotional exhaustion	1.97	0.54	2.97	0.55	2.28	21.74***
Depersonalization	2.38	0.48	3.38	0.48	1.28	23.78***
Low achievement	1.48	0.40	2.48	0.40	10.87***	3.80
Total Job burnout	5.83	0.92	8.83	0.88	8.14**	39.34***
Discord	34.09	4.51	49.87	4.30	9.02**	0.94
Not flexible	16.61	4.00	28.54	4.03	8.82**	24.34***
Stereotypy	19.00	4.11	26.04	4.07	1.57	0.43
Total self-disharmony	69.69	8.06	104.45	7.62	15.32***	11.87***
Interpersonal trust	50.21	3.67	39.07	3.73	7.12**	23.73***

Note: * indicates p <.05, ** indicates p <.01, *** indicates p <.001.

3.2 Regression Analysis of Job Burnout on Self-harmony and Interpersonal Trust

Taking the total score of job burnout as the dependent variable, this study has made a 3-step regression analysis taking into the regression equation first the identity of the subjects and the seven demographic variables and finally self-harmony and interpersonal trust. The result is shown in table 2.

In the three equations, the standardized regression coefficients of the identity variable are significant .In the third equation, the standardized regression coefficients of the three factors of self-harmony are also significant. But the predictive force of interpersonal trust on job burnout is not significant.

Table 2. Regression analysis of job burnout on self-harmony and interpersonal trust

Predictor	equation 1	equation 2	equation 3
	β	β	β
Identity	-0.85***	-0.90***	-0.40***
Gender		0.03	0.03
Age		0.05	0.06
Teaching experience		-0.02	-0.03
Education		-0.04	-0.03
Income		-0.01	0.02
Gread		0.03	-0.01
Urban and rural areas		-0.04	-0.01
Self-experience disharmony			0.21***
Self is not flexible			0.27***
Self-stiffness			0.08**
Interpersonal trust			-0.06
F change	1351.12***	1.81	28.59***

Note: * indicates p <.05, ** indicates p <.01, *** indicates p <.001.

3.3 Path Analysis of Self-harmony and Interpersonal Trust on Job Burnout

Self-harmony and interpersonal trust are two protective factors for job burnout. But what pattern do they take? This study takes self disharmony as the intermediating variable and tests whether interpersonal trust will influence job burnout through interfering with self-harmony. [7].

First, this study carried out an effect adjusting test and then an mediatingt effect test whose results are shown in table 3 and figure 1.

Table 3. Path analysis of self-harmony and interpersonal trust on job burnout

	Predictor	Burnout as the dependent variable		Discord as the dependent variable self-
administrators		equation 1	equation 2	equation 3
		β	*β*	*β*
	Interpersonal trust	-0.37***	-0.16*	-0.61***
	Self-disharmony		0.34***	
	F change	28.76***	17.22***	108.42***
regular teachers		equation 1	equation 2	equation 3
		β	*β*	*β*
	Interpersonal trust	-0.23***	-0.09	-0.46***
	Self-disharmony		0.30***	
	F change	16.20***	24.63***	77.45***

Note: * indicates p <.05, ** indicates p <.01, *** indicates p <.001.

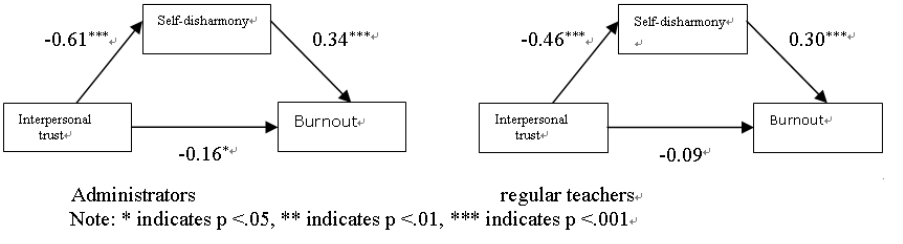

Fig. 1. Path analysis of self-harmony and interpersonal trust on job burnout

4 Discussion and Results

4.1 Variance Analysis of University Administrators and Teachers' Job Burnout and Self-harmony and Interpersonal Trust

The job burnout level of university teachers is significantly higher than that of university administrators and self-harmony and interpersonal trust of university administrators are noticably better than that of university teachers.

Most of the university administrators are outgoing, gregarious, kind and easy to get along with others, cheerful, lively, sociable, and better adapted to the environment; they are not rude, considerate, generally of higher level of socialization. At the same time university administrators are emotionally stable and more objective. They can analyse issues rationally, work steadily tactfully; They are gentle, self-restrained and strong. So they can keep their awareness of reality and self in uniformity enabling them to experience more self-harmony.

Interpersonal trust of university administrators is better than that of university teacher, which means that they enjoys a more harmonious interpersonal relationship. In the mean time, administrators' job burnout level is lower than that of university teachers, the reason of which may lies in the fact that university administrators are better at making use of various social supports coming from society, family and working unit. Social supports work in their working environment through adjusting their work attitude. It is especially true that the social status of university administrators can help to bring on a sense of achievement which helps to lower their job burnout level. From this perspective, the job burnout of ordinary teachers should be paid more attention to by relative authorities.

Sex also plays a role in university staff's job burnout. For the teachers group, male teachers' work burnout level is higher than that of female teachers; for administrators, female administrators' work burnout level is higher than that of male administrators and their self-harmony and interpersonal trust are lower than that of male administrators. This is probably related to the fact that the socity usually has higher expectation of male teachers and female administrators leading to their negative psychological experience.

4.2 The Impact of Self-harmony and Interpersonal Trust on Job Burnout as Protective Factors

Self disharmony and interpersonal trust are two important factor influencing university administrators' job burnout. Through the pattern analysis, their influence on administrators and teachers are different.

Self-harmony is an internal factor affecting job burnout and the disharmony of self and experience reflects the relationship between self and experience including self-evaluation of one's own abilities and emotions, self congruence, helplessness and so on. On most occasions, self disharmony reflects one's unreasonable expectation and self inflexibility, suggesting one's sterotyped ideas and rigidity. Interpersonal trust is an interpersonal factor which influences job burnout. If interpersonal trust becomes lower, one is easy to fall into isolation and becomes more negative causing interpersonal relationship to become tense. When one doesn't have self-harmony and one's interpersonal trust becomes worse, one can easily be over consumed emotionally, fatigued, loss of energy, thus making one feel incompetent for their job and unable to experience the happiness of their job and sense of achievement from it.

5 Conclusion

With the seven demographic variables under control, this study has found out that interpersonal trust of university administrators has a direct predictive force for their job burnout level, and self-harmony functions as a intermediating factor, Interpersonal trust of university teachers. However, It does not have such direct predictive force and self-harmony acts as the whole intermediating factor. This means that university administrators can better protect themselves through making better

use of their interpersonal relationship than university teachers. For university teachers, self-harmony which is an internal factor can help them to make use of interpersonal trust to strengthen their protection against job burnout.

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Design of Mechanical Engineering Project Courses Based on Complex Project Carrier

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Abstract. Project-based teaching approach has been promoted in the existing higher vocational education. Aiming at the problem of independent among various projects and difficult to achieve competence progression, the project curriculum based on complex project as a carrier is proposed. According to the various stages of training requirements of vocational competence, a complete curriculum system is established. A typical example of computer-aided design and manufacture specialty is given to carry out typical task analysis. The project-based teaching approach was presented under agricultural machinery as a project carrier.

Keywords: higher vocational education, project course, project carrier, typical task analysis.

1 Introduction

Practical teaching activities are the important parts to achieve vocational personnel training objective. To reform the training mode and enhance the employability of students, teaching mode reform integrated with study, train and doing such as task-driven and project-oriented teaching approach must be carried out. As social demand for skilled personnel increased, vocational teaching mode under traditional academic disciplines has not kept up with social demand for skilled personnel. Strengthening the practical teaching activities, improving practical teaching system, implementing practice-oriented teaching approach and self-learning process have become important theme to promote higher vocational education reform[1].

Current higher vocational education emphasizes students' competence and quality. Working process oriented project teaching approach focuses on vocational competence development and strengthens the awareness of career position. The project-based teaching approach has carried out reform and innovation in the aspect of curriculum, content and teaching method[2]. The competence with independent planning, implementation and evaluation can be trained through the

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implementation of specific project. Especially in teaching of professional courses, the comprehensive vocational competence is trained with integration of teaching content to complete the project tasks[3]. Project-based teaching approach has widely used in higher vocational education[4]. There is problem existed that the competence progression is difficult to achieve in the process of competence training because of independence among the projects and the lack of interrelation. This paper attempts to establish a complete practical teaching system with a complex project as a carrier to form a multilevel project-based curriculum.

2 Design Approach of Project-Based Curriculum

The project-based teaching approach is to train a comprehensive competence for students that the teaching activities are carried out by teacher and students together in teams to implement a complete project work. Main difference between project-based teaching and traditional academic teaching approach is embodied with three "transform", i.e. transforming teacher-centered into student-centered, transforming theory into project, transforming lecture into practice. The content of project based on usual project teaching approach is independent with each other. It is not conducive to vocational competence development for students. However, the competence development is a gradual process from basic to professional and comprehensive competence. It is very important to select appropriate project carrier to design project curriculum. In project-based teaching process, a complex project is divided into several small projects so that the specific task-driven project teaching activity can be carried out with these projects. Small project is designed for individual task which function is to enable students to master basic knowledge and professional skills and develop individual competence. A complex project is to train student comprehensive vocational competence and improve professional knowledge and skills.

The comprehensive training activities based on complex project as a carrier emphasize the integrity of the working process. A set of individual practical activities are integrated into typical tasks under a complex project carrier to train student vocational competence including professional skills and social competence[5].

Project-based curriculum must be working process oriented that the teaching content is the necessary knowledge and skills to complete professional tasks and develop vocational competence. The carrier of mechanical project curriculum is usually product or system. The carrier for a specific course can select a complete project which covers all tasks need to carry out as much as possible.

3 Project Courses Design for Mechanical Engineering

After the determination of a project, typical task analysis is carried out with project carrier to establish a complete practical teaching system. Task analysis is to decompose the tasks required to complete for an occupation or occupational group which purpose is to obtain specific working content and vocational competence.

Typical tasks are described with representative vocational behavior and working relationship. The development process of working process-oriented curriculum include: establishing working groups; obtaining typical tasks; summarizing and integrating typical tasks; identifying learning field; designing learning environment for the field of study.

The typical occupation for mechanical engineering includes product design, CNC programming and machining, machining process planning, mold design and manufacturing, quality inspection etc. These positions require the appropriate vocational competence such as mechanical drawing, product modeling and machining competence. The partial tasks for mechanical engineering are shown in Table 1.

Table 1. Partial typical tasks for mechanical engineering

Occupation	Typical Tasks	Vocational Competence
Product design	According to the task or customer requirements, designing product architecture, determining design scheme, engaging professional work such as mechanical drawing, product modeling, preparation of parts list and relevant technical documents.	• Be able to draw mechanical drawing • Be able to use two-dimensional CAD software • Be able to use three-dimensional design software • Be able to do reverse design • Be able to use office software to deal with technical documents
CNC programming and machining	According to the requirements of part drawings and technical process document, programming CNC machining program manually or automatically, and machining parts with CNC machine tools.	• Be able to use at least one main CAM NC programming software • Be able to use the common measuring tools, cutting tools and fixtures. • Be able to carry out maintenance of CNC machine tools

Computer-aided design and manufacture is a typical mechanical engineering specialty to train skilled personnel in the fields of mechanical product design and manufacture. Following three aspects of competence must be mastered:

- Basic competence: drawing mechanical drawings, operating machine tools.
- Core competence: CAD/CAM software application, product modeling, machining process planning, CNC programming and CNC operation.

- Comprehensive competence: complex product modeling, reverse design, mold design and manufacture.

3.1 Project Curriculum

The curriculum of higher vocational education is offered with occupation group of technical fields to integrate with theory, practice and quality so as to determine training objective of knowledge, competence and quality. According to training objective of vocational competence, the project curriculum is offered with typical practical activities. Main project curriculum of CAD/CAM specialty is shown in Table 2.

Table 2. Project curriculum of CAD/CAM specialty

Course Modules	Core Courses	Teaching Activities	Vocational Competence
Basic module of mechanical engineering	• Mechanical drawing • Mechanical manufacture	• Mechanical drawing • AutoCAD • Machining training	Basic competence
Mechanical design and process module	• Machining process	• CAD special training activity • CAM special training activity	
CAD/CAM software module	• Application of CAD/CAM software	• CNC machine operation	Core competence
CNC programming	• CNC programming		
Reverse design Business-education compacts		• CAD/CAM training • Training in enterprise	Comprehensive competence

3.2 Project Carrier

To achieve the competence training, a moderate complex agricultural machinery is selected as a project carrier to establish project-based practical teaching system. In the specific teaching process, small project as a single practical activity is to train basic vocational skills. The core competence is upgraded gradually under more complex carrier. Finally, the comprehensive competence is trained with complex project as a carrier to implement.

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University Culture of Innovation Promote the Healthy Development of University Education

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Abstract. University culture is an important part of social culture. As a heritage of civilization, the university culture of communication and innovation has become an important way to development of the University. The content of university culture of innovation can be divided into educational philosophy, University of spirit, system construction, culture, the image of five aspects of the University. So many angles and dimensions to innovation and university culture, the universities take on the important task of leading the social culture, the university culture of innovation and healthy development of university education as the power source.

Keywords: University Culture, University, Innovation.

University is the country's higher education institutions, to provide comprehensive teaching, research conditions and institutions of higher education authorized to award degrees. University carries more than just an educational institution, more importantly, there is a culture. University culture is the soul and spirit. University culture can affect many students, and engraved in the memories. University cultural construction and cultural construction is an important part of the construction of the University connotation. Innovation and the development of university culture is the important task of the University, is a necessary condition for building first-class university, the healthy development of university education is an important way.

1 First, the Connotation of University Culture

University culture, the university ideas, systems and processes and a spiritual atmosphere. University Cultural its meaning is broad, including: educational philosophy, school policy, institutional and management, teaching and research work. Main content can be summarized as material culture, system culture, spiritual and cultural content of the three levels. What kind of university culture, what kind of students will be nurtured. Comprehensive development of university culture can nurture talents and become national revival and cultural renaissance of the backbone, leading the community forward. University culture is the knowledge, ability and personality of the sublimation and crystallization.

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2 Second, the Main Content of University Culture of Innovation

National cohesion and creativity and culture is an important source of competition in overall national strength is increasingly becoming an important factor. University of culture as an important part of socialist culture to continuous innovation.

Innovative Educational Philosophy. The concept of University of the University school of thought, orientation, educational goals, school means the sum. University of the innovative educational philosophy is the premise of innovation in higher education.

Socialist core value system represents the essence of socialist ideology, with the outlook on life, world outlook, attitude to life closely linked. Socialist core value system and social development covering the guiding ideology, ideals and goals, spiritual support, represents the essence of mainstream ideology. Not only affect the people's thinking, but also affect the way people think.

Innovative concept of Running the guidance of Marxism, to socialism with Chinese characteristics based on the concept, with patriotism as the core of the national spirit of reform and innovation as the core content of the socialist core value system. University culture is a kind of education should reflect on the inherent laws and trends. University College educational philosophy is to guide the direction, what kind of educational philosophy, there will be what kind of college education, there will be what kind of college culture.

University Spirit of Innovation. University of spirit is the core of university culture. University is a place where cultural heritage, the University reflects the essence of the spirit of society. Carrier of the spirit is the University motto, school spirit, school song and so on. University of the Chinese nation the spirit of innovation and creativity and vitality. University of the spirit of innovation should be the following aspects.

"Freedom is the prerequisite for the pursuit of truth, or truth, a prerequisite for the exercise of freedom." [1]The spirit bear with the University of freedom of spirit, innovative spirit. If the University does not a free academic atmosphere is for the university spirit of innovation and university culture without any benefit. Free and relaxed atmosphere is the ideal environment for academic research. In college, "the lack of scholars and democracy requires not silence, is not agreed, but 'civilized debate,' ... ... not a disaster of academic conflict, but the opportunity. University must provide all rational inquiry is necessary to presuppose that the control of non-partisan forum, the opposite can contact each other in this forum, under the common agreed principles of evidence and logic to explore the similarities and differences between each other. "[2]Academic freedom to explore truth, and to promote university spirit of innovation and development.

Construction of Innovation Systems. Innovative university culture to exclude the development of universities is not conducive to innovative system of university culture barriers. With the vigorous development of China's higher education needs of socialist modernization and the urgent need to promote the University System.

University of the school system should be revised and supplemented. Such as the university system too rigid, no further strengthening of academic power, increasing administration of the school management and so on.

Innovation system construction should focus on how to cultivate innovative talent, innovative culture, innovative thinking to do. The first is to implement human resources strategy. To talented personnel, research and school legislation anchored. School through the system to protect the best use. School teachers and students using the system to build up a loose display platform. So that every student can feel pleasure in the learning and research into. Act according to rules and regulations, rules and regulations protect the school with a culture of innovation strategy successfully implemented. Second, innovation and personnel training systems. Innovative training model. University to the needs of society and in social practice to find the focus of theoretical innovation. Further reform of education to further enhance the timeliness of teaching, scientific and flexibility. Establish and improve the personnel evaluation system. Strict implementation of incentive measures, continue to inspire teachers and students explore in depth the internal law of personnel training, innovation and intellectual cultivation.

Cultural Connotation of the University of Innovation. University of the connotation is growing, and in the process of development with the characteristics of the times. Innovative university culture to enrich the University culture.

With the ecological era, higher education should also enhance environmental education, construction and development of green culture, really play to their social function.

Academician Wang Dazhong, the former President of Tsinghua University said: "Green University" that is the core around the person's education, sustainable development and environmental protection principles guiding the implementation of various activities to the students, into the whole process of university education. [3]Green Culture advocate the use of the green into the guiding ideology in the long term development based on the school to organize the implementation of the school's work. Use "green technology" awareness of scientific research, sustainable development and environmental protection awareness throughout all aspects of scientific research. So that the economic benefits of scientific research from a single transition to the environmental benefits and economic benefits. Green also pays attention to environmental management of university culture and environmental protection. Universities should promote low carbon living, green campus, to strengthen the comprehensive management of pollution on campus.

Image Innovation University. University cultural image can be divided into two areas one is the objects, and the other the image of the organization. University of objects is done mainly with environmental and cultural impact of university culture of innovation. Universities are the University buildings in the visual aspects of cultural symbols. University of objects can express a cultural atmosphere, so that students feel on campus in terms of feeling well, resulting in the University for academic pursuits, and fear of some kind of mental suggestion. Organizational image of the university culture in the minds of the vivid performance. University of the image, once formed, will be in the public impressed, and for a long period

of time to play the role of orientation. University to progress and development, in a highly competitive environment to maintain their advantage on the need to focus on shaping their own image. University of the image of the university's business card to pass the school badge, motto, and the campus environment, campus landscape, a good style of study, teachers and students in the spirit of features to enhance the University image.

3 Third, the Innovation of University Culture on the Importance of University Education

University can continue to create a culture of innovation and better and more outstanding cultural achievements. Construction and development of the University played a leading and decisive role in promoting the survival of the fundamental university, the development of the university an important significance.

The Innovative University Culture can Enhance the Core Competitiveness of the University. University's long-term development must rely on university culture. University as a cultural transmission of the main positions, the cradle of human culture is to continually explore and create new cultural achievements. Otherwise, it loses the true meaning of the university. To strengthen the University of innovation culture, we must promote equality and freedom of academic exploration. Construction of the University's own development needs of the innovative university culture.

University Cultural competence is soft power, and its solid foundation is discipline, talent, teaching, research and other aspects. Culture of competitiveness is in the university course of development, innovation made. University in the development process requires constant cultural innovation. In this culture to radiation and impact on society, this is an inherent requirement of the University itself. University culture is an important part of national culture, a direct impact on university dissemination of knowledge, social services functions. University culture of innovation is the inevitable further development of the modern university requirements.

University Culture of Innovation Will Help Cultivate Talent. University is the training of talents for the goal is to train outstanding talents. University is the essence of scientific research, the pursuit of truth, innovation, value and nurture talent, the most essential is to cultivate talent. Cai Yuanpei, said: "Education is to help those being educated, and give him the ability to develop their own, completion of his personality, and the human race can do duty as a member than to be educated, resulting in a special apparatus, to have the purpose of his people to kind of application. "[4] University of culture on students ideas, values and behavior have a subtle influence. University culture conducive to innovation and cultural education purposes.

Innovative University Culture Conducive to Social and Cultural Development. The essence of culture as a social man will dissolve in the blood of every being. Work A well-known scholars believe that culture and politics, the economy is

different. Fundamentally, not with the political and economic phenomena or areas in parallel, but all human activity areas and all areas of inherent existence, mechanism of things; culture is deeply constrained and influenced from every individual and every society way of life. University culture and social culture are inseparable. University culture is the social culture of innovation promoter, leading social and cultural development. University culture and contemporary values of China's advanced culture that has internal consistency. University culture of innovation will determine the social and cultural nature.

Conclusion: Reform of university culture can enhance university education, promote the healthy development of university education. Reform of university culture has an important significance. Inherit and carry forward the existing universities in the University culture, we must advance with the times.

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Construction of Talent Training Scheme Based on Innovative Practice Ability

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Abstract. Based on the four constitution elements of innovative practice ability (IPA) which are respectively innovative practice motivation, conventional IPA, professional IPA and comprehensive IPA, the construction model of talent training scheme in universities has been studied. The necessity of IPA as the basic objective of talent training in universities has been discussed. The leading role of IPA in training specification which includes knowledge, ability and quality has been emphasized. Aimed at forming innovative practice motivation, strengthening conventional IPA, promoting professional IPA and accumulating comprehensive IPA, four curriculum systems have been constructed. The teaching mode named "two primary, four combination, three drives" has been created. The research results provide theoretical guidance for formulating the talent training scheme.

Keywords: Innovative practice ability, Talent training scheme, Construction.

1 Introduction

Training scheme is the guideline to implement talent training scheme and the basis of quality evaluation. And mainly it composes of training target, training specification, curriculum system, training model and teaching links in classroom. Training IPA is related with the success or failure to train innovative talents[1,2]. Only the implementation scheme of construction elements of IPA in talent training scheme has been specified, the objective to train innovative talents has been accomplished. In this paper, based on IPA, the construction model of talent training scheme has been discussed.

2 IPA Is the Basic Objective of Talent Training in Universities

The training target is a kind of value limitation to the future behavior orientation and development possibility of students according to the development needs of students and society. Therefore, once a training target has been established, it means that the corresponding institutional behaviors and the ethical behaviors in the framework of training target have been produced for the educated groups. And these behaviors

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will decide the future contribution and efforts of students to social development. So the training target in training scheme must be reasonably determined.

Social progress and economic development have been written undoubtedly in the history during human continuous practice, and the practice has become the basic model of human existence. The practice ability is a basic ability of human survival. Innovation is the basic requirements to develop forward for the human society. And the innovation realization cannot be independent from the practice. As one of practice abilities, the IPA not only show the levels of practice ability, but the features of practice ability. And it is an important symbol of innovative talents. So the training practice ability has been paid a great attention, especially the IPA. The IPA is the basic goals of talent training in universities.

3 IPA Is the Essence of Talent Training Specification in Universities

Training specification is an important content in training scheme, and includes the requirements of the "three structure" which are the knowledge, the ability and the quality. The knowledge is the energy foundation of ability formation and the diathesis promotion. The ability is an external performance of diathesis and the appearance of physical and mental energy when the knowledge has been accumulated to a certain degree. The diathesis is one kind of psychological energy, and is the stable psychological diathesis from the knowledge assimilating after education and effect from social environment on congenital physiological basis. In the "three structure" system of knowledge, ability and diathesis, the ability is suitable to be observed. So the talent training in universities has been carried out on emphasis of ability training, and apparently it is practical that innovative practice ability be the basic training objective.

Knowledge structure of training specification lay the foundation for formation of IPA. To successfully complete innovative practice tasks, the profound and extensive knowledge reserve is necessary. Knowledge structure could be examined from two aspects. The one is the knowledge structure itself. Knowledge structure includes conventional knowledge and special knowledge. It is necessary to form the discipline knowledge framework on the basis of the comprehensive basic concept and principle. The other one is the construction of knowledge structure. It is necessary to form the knowledge acquisition ability and knowledge constructing ability, and make the acquired new knowledge to be reconstructed continuously and improved in own knowledge system. And it makes knowledge to be systematized and activated.

Ability structure of training specification need adopt the "four dimensions and thirteen elements" of IPA as the template, cores of which are matching analysis ability, planning ability and execution ability. The matching analysis ability requires that facing practical problems the individuals assess their own ability, the question situation and the existing resources, and determine whether to begin the practice. When the choice has been decided, the action plan and the solution scheme have been determined. That’s the planning ability. When the solution

scheme is determined, it would be executed. The ability to carry out the solution scheme which dominates physical and mental activities in practical situation is called the execution ability. In ability structure, to train matching analysis ability, planning ability and execution ability should be emphasized

Diathesis structure of IPA is mainly reflected in the initiating and sustaining, the analysis and planning of innovative practice. At the beginning of individual practice, a start-up power is necessary. As the practice is constantly going on, the power would vanish, or continue to maintain and adjust practice process. The power is the innovative practice motivation. Practice interest is the more stable and lasting psychological tendency of the individuals to some practical activity itself. When practice interest is formed, it will result in positive mood and emotion experience for the corresponding practical activity. The individuals which have strong practice and achievement motivation have higher goals in practice, and are willing to accept the challenge. Even the individuals have no interest to practice objects, they will try their best. Practice pressure refers to the requirement for the individuals to participate in practical activities from external subjective and objective environment, and it has the externality and the passivity. Driven by practice pressure, the individuals go into the practice fields. But with the familiarity to practice fields, practice interest and practice achievement motivation will gradually come into being, and the individuals will show the practice ability at a high level.

4 IPA Is the Main Line of Curriculum System

The core of training scheme is to construct the flexible and distinctive curriculum system, which generally consists of major training plan, auxiliary training plan, public elective plan and second class activity plan. The major training plan is composed by four curriculum platforms, namely the public compulsory platform, the subject compulsory platform, the professional limited choose platform and the free choose platform.

Forming the Curriculum System for Innovative Practice Motivation. It is necessary to emphasize student individuality development and give students more independent space for training innovative practice motivation. For developing the practice interest, the different requirements of students have been met with the free electives platform, and the elective courses have been increased at the premise of enough compulsory ones. Hours of the compulsory courses have reduced, and the public elective courses have been increased. The total hours of the elective courses (including limited and free electives) should not be less than 25% of the total class hours. In the practice pressure, various practice links have been set through improving the practical system, such as experiments, curriculum design, graduation design, engineering training, science and technology activities, cognition practice, production practice, and social practice. The credits and the hours of practice links have been regulated. For the four-year undergraduate majors, the total hours of practice links have been controlled in 40 to 42 weeks for the engineering majors, and 36 to 38 weeks for the other majors such as arts, science,

economy, law, and management. In practice motivation, the evaluation criteria of practice teaching have been improved, and materialized production (papers and material objects) during practice links have been encouraged. With the materialized fruits, practice achievement sense of students has been enhanced.

Strengthening the Curriculum System for Conventional IPA. The conventional IPA includes situation perception, knowledge construction, information communication, interpersonal communication and body movement. In curriculum system, the problems about situation perception should be firstly solved. The practice environment refers to the combination of a series of external conditions required by practical activities. To develop IPA could not be independent from the diverse practice activities environment, and the four environments which are respectively real environment, simulation environment, classroom teaching environment and extracurricular activities environment could be created. To create real environment with the school-enterprise cooperation provides the position practice and the real training for students in enterprises, and shortens the distance between students and enterprises. The simulation environment similar to practical working environment, such as teaching experiment, has been created. In the practical teaching link, it is necessary to determine the site, the project content, the time, the guiding personnel and the appraisal standards, and create the practice activity atmosphere of working, saying, and thinking for everyone. In theory teaching, the intuitive teaching means and the studying appliances such as pictures, charts, models, specimens, acoustic image, multimedia teaching and so on could be widely used to create the activity environment to cognize and exercise for students, and strengthen students' perceptual cognition. To develop the extracurricular activities environment is limited with time and space in classroom teaching environment. The scope and the time of practice activities for students is limited. Therefore, to create rich, colorful, diverse, and all-weather open extracurricular activities environment is very important to training the diverse practical ability of students.

Promoting the Curriculum System for Professional IPA. Professional IPA includes the special knowledge and the special skills. Special knowledge may be ensured with the discipline compulsory and profession limited curriculum platform, and specialized skills may be trained with the practice teaching system. In the discipline compulsory platform, the curriculum have been set according to the professional direction and the needs to develop the professional ability, and in profession limited curriculum platform, the curriculum have been set according to the professional characteristics.

In this system, the frontier trends of science and technology should not be forgotten when classic knowledge has been taught. Based on premise of broadening the basic knowledge, the proportion of the teaching hours of professional curriculum to theoretic curriculum may be appropriately increased. The proportion of hours of public basic courses, the discipline basic courses and the professional courses to the total hours are approximately 45%, 37% and 18%.

In course schedule, arrangement meets with the requirement of logic relationship between the courses. At the same time, the professional basic courses and the professional courses should be considered early, which enables the students to

participate in the teachers' research projects. The students can enter the laboratory, and it is possible for tutoring the graduation design throughout the process of four years. The tutorial system may be adopted in training mode. The students could be instructed with the special teachers, and taught according to their aptitude.

Accumulating the Curriculum System for Comprehensive IPA. Comprehensive IPA includes matching analysis ability, planning ability and execution ability. It is needed to deal with the real problem situations, and break the psychological set. And the comprehensive IPA may have been continuously accumulated. To make practice education idea run through all process of students training, while the theoretic knowledge have been emphasized, compressing and simplifying the theory teaching hours and increasing practice teaching links and hours should have been going on. The complete practice training system should be established. To develop practice teaching with enterprise, the practice community need establish. To construct practice community of teachers and students, students need join into research projects executing research program. To organize the rich extracurricular practice activities with student leagues as the main body form students' practice community. At the premise of playing the curriculum function in schools fully, students' extracurricular activities and scientific and technologic innovation should be increased. The perfect combination of class education and extracurricular education should be paid attention, and the second classroom should be added into training scheme. Students should be encouraged to take part in extracurricular activities in science and culture, and it is specified that students should obtain five credits both of scientific and technologic innovation activities and academic community activities when they graduate on time.

5 IPA Is the Soul of Talent Training Mode

Talent training mode refers to the construct of knowledge, ability and diathesis built by schools for students, and the way to achieve this structure. It mainly relates to three questions which are "train what", "what train" and "how to train". For a good course system, the knowledge structure and the ability training approach have been provided, but the teaching links are unreasonable, it is also impossible to transfer the knowledge structure into students' cognitive structure. Here it is primarily to answer the third question.

Innovative education emphasizes that students must master the necessary knowledge, and the change from traditional education with teaching knowledge as the center to modern education with training students' IPA. The more reasonable curriculum teaching mode has been come into being according to the long-term teaching practice, namely "two primary, four combination, three drives". The "two primary" refers to that the guidance and the ability training is given priority to in teaching ideas. The "four combination" means that the combination between the theory and the practice in the teaching content, the combination between the traditional and the modern in teaching manner, the combination among the autonomic, the open, the comprehensive and the innovative in the experimental teaching, and the combination between the pertinent and the comprehensive in the teaching

examination. The "three drives" is namely to carry out the classroom teaching with the traditional way driven by the homework, the computer experiment and the social practice driven by the tasks and the extracurricular practice and lectures driven by interest. It strives to orientate for each class and courses according to the teaching characteristics itself. Through this teaching pattern, the talent training of IPA has been accomplished.

6 Conclusion

Based on the constitution elements of IPA, the construction model of talent training scheme in universities which includes training objective, training specification, curriculum system and teaching mode has been studied. The conclusion of IPA as the basic objective of talent training in universities has been provided. Four curriculum systems which aim at forming innovative practice motivation, strengthening conventional IPA, promoting professional IPA and accumulating comprehensive IPA have been constructed. The teaching mode named "two primary, four combination, three drives" has been created.

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On the Plight and the Solving Way of Higher Engineering Education

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Abstract. In contrast to the booming Chinese construction process, the higher engineering education in China relatively lags behind and has some problems and difficulties in the aspects of education pattern, teaching evaluation, teaching content, and teaching methods. Therefore, in order to get out the plight, engineering universities and colleges should actively explore the reform path and make a series of educational change on China's higher engineering education under the guidance of the educational philosophy of "learning for use, pragmatic, practice-oriented". In detail, they should focus on the cultivation of the students' practical ability and the construction of the students' interdisciplinary knowledge structure, give more attention to international cooperation and inter-school cooperation, and cultivate the practical awareness and strengthen the school-enterprise cooperation.

Keywords: Engineering education, Teaching pattern, Educational philosophy, Solving way.

1 Introduction

The quality of the engineers is tremendously related to the success or failure of the engineering construction in many countries. Under the background of building the innovative country, engineering education should be committed to developing a large number of innovative, practical engineering staff. However, it is obvious that the current higher engineering education in China can not meet the requirements for the innovative engineering construction and there are some serious problems in it. Therefore, engineering universities and colleges should establish the educational philosophy of "Learning for use, pragmatic, practice-oriented" and explore a reforming path which is in accord with the characteristics of higher engineering education to solve the problems and difficulties of China's higher engineering education.

2 The Problems in China's Higher Engineering Education

According to our current understanding, the higher engineering education in China has the following main problems.

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A. The educational pattern is quite simple. The courses that are set in China's higher engineering education higher engineering can not adapt to the rapid development of industry and society. We should consider the system and pattern of engineering education that does not meet the current social and industrial need, but also is accord with the future development in both the structure and the proportion. We ought to understand that the pattern of engineering education is diverse, flexible and changing. That is to say, we ought to carry out multi-level engineering education in different regions and industrial sectors according to the enterprises' demand for the engineering staff and the division of labor. For example, from the view of the level of engineering education, there are specialist, undergraduate, master's, doctoral and postdoctoral; from the view of the training objective, technical schools should focus on training the operation workers, secondary vocational schools train the technical personnel, colleges train the engineering personnel who excel in product technology and quality control, and universities train the business leaders and the engineers who master the product design and manufacturing; From the view of the type of the engineering activity, some should emphasize on research, design, creation and planning, the others are more involved in production and sales, management, technical consulting, safety monitoring, quality management, standards and regulations, assessment and decision-making advice, and education and training. But now many universities and colleges in China have the similar curriculum. The students trained in them do not have their own characteristics. That causes that the students do not have the professional orientation and are not well accord with the needs of society. What is more, the undergraduate may do the work of the operative worker, and the graduate students can not independently accomplish their own engineering activities.

B. The subject of the curriculum evaluation is relatively single and is not able to reflect the function of the curriculum reform. The purpose of the curriculum evaluation is to promote the development of students, teachers and schools, continuously improve the teaching standard and the teaching quality, and inspire the internal driving force of students and teachers to realize their own value. However, there are still some problems in the existing system of curriculum evaluation, which is not conducive to curriculum reform: Firstly, under the impact of the exam-oriented education, the curriculum evaluation is too biased towards the assessment of knowledge and is neglect of the comprehensive quality such as practical ability and innovative ability. Secondly, the curriculum evaluation is too biased towards the class content and the teaching activities within schools, is neglect of elective courses and practical courses, and is not conducive to the development of humanities. Thirdly, the curriculum evaluation is always linked to the professional performance of the faculty, which is not conducive to the integration between social sciences and natural sciences. Fourthly, in the system of the curriculum evaluation, the government departments evaluate the schools; the schools evaluate the teachers; the teachers evaluate the students. The students are excluded from the evaluation subject and only regarded as an evaluation object. Therefore, the kind of evaluation does not highlight the subjectivity of students, which is not conducive to the students' participation in curriculum reform independently.

C. The educational content is relatively empty. “At present, the problems in the cultivation of engineering students in the universities and colleges are: a narrow range of knowledge; being short of innovation ability, communication ability, and analytical ability; being not interest in the engineering activity; apparently being lack of practical experience in engineering; being not clear to the goal of the engineering education, which leads to that the students are not concerned about the features of the engineering activity and in the blind pursuit of high-level trends; no having enough communication and interaction with the enterprises and no taking forward-looking to the market demand.”[1] The universities and colleges have great differences in what are the knowledge base and ability training to be eligible modern engineering personnel. They are still not definite to the content of cultivating the engineering staff.

D. The traditional teaching ideas are deep-rooted, and the teaching methods and means are obsolete. “At present, no matter in the knowledge structure, curriculum, practice teaching, or in the classroom teaching content, methods and means, there are some aspects that are urgent to be reformed and improved in the engineering education in the undergraduate phase.”[2] The teaching method in China is to take the teachers, classroom and books as the center and only emphasize on the students’ in-depth analysis ability and logical thinking ability. That makes the ignorance of the students’ ability to acquire knowledge in an active way and does not fully mobilize the enthusiasm of the students.

E. The traditional training pattern attaches more importance to technology rather than culture and ignores the training of the humanistic quality of the engineering students. For a long time, China’s engineering education is shaped by the planned economy. That results in the drawbacks that the engineering universities and colleges often have the weak humanistic education. Therefore, we ought not only to do the reform on the curriculum of engineering education to make the human courses, economic courses and law courses taking a certain proportion in the engineering education system, but also make the engineering ethics, engineering history, economic management, biology, philosophy, law and other courses be the required curriculum which are able to be accord with the engineering courses. At the same time, because the cultivation of the compound talents is still based on the professional knowledge, we must be careful not to go so far in the process of the curriculum reform that we only focus on the education on social sciences and ignore the teaching of the professional knowledge. The main goal of engineering education is to train the professional staff. But it should expand its contents to meet the social needs, to cope with changing needs, and to achieve the transformation from the professional talents to the compound ones.

3 The Solving Way in China's Higher Engineering Education

In order to solve the problems in China's higher engineering education, we should change the teaching pattern of mechanical memory and passive imitation to cultivate the students’ creative consciousness, take the case teaching pattern and the integrated teaching pattern that are closely connected with the practical situation to cultivate the practical ability of dealing with the engineering problems in virtue of

theoretical knowledge, practical experience and intuitional judgment, and train their the scientific spirit and humanistic qualities for solving the engineering problems. We should make the organic re-engineering to these kinds of disciplines (mechanics, electronics, computer, materials, management, economics, culture and other disciplines), and carry out the interdisciplinary education. Only in this way can the engineering education be high quality and make out the students to meet the needs of industry and society.

A. Focusing on the cultivation of the students' practical ability. The engineers in the future society should not only learn the basic knowledge, but also cultivate their practical ability. Therefore, we should attach much importance to the engineering students' problem-solving skills in the process of higher engineering education. In the aspect of constituting the teaching plan, we should focus on developing the students' practical ability, improve the quality of theoretical teaching, and truly implement the teaching practice in virtue of the effective enterprise practice to make the students combine the theoretical learning to the practical situation and solve the problems in the process of engineering activity under the guidance of innovative spirit.

Firstly, we could start the reform from the teaching content, make the demonstrating experiment gradually transform into the integrated one, constantly develop the new experiments according to the renewal of the teaching content. At the same time, we could change the laboratory management and student experimental management to make the experiment actually play the role in strengthening the students' capacity. Secondly, we need to improve the qualities of internal and external training and curriculum design. The teachers should rigorously ask students to carefully complete the contents of training and design to thoroughly strengthen the students' responsibility to the work and the cultivation of the engineers' basic quality. Thirdly, we could provide the students with some projects to make them actively look for the corresponding data and learn with the question conscious when they enter the universities and colleges. In the second and third year, the students would have a certain professional basis and the teachers could start to guide them to design the projects. In the fourth year, the students could do their graduation design and complete their projects.

B. Focusing on cultivating the students' interdisciplinary knowledge structure. The current trend in higher engineering education is to provide students with interdisciplinary knowledge background and strengthen the engineers' non-technical education to make them have the knowledge of humanities and social sciences, which are the necessary foundations for establishing the engineers' views of world, life, values and professional ethics. In the process of engineering construction, the engineering and technical personnel should not only know the technology well, but also master the economy and management to have certain organizational skills and be good at cooperating with others. There should be no the insurmountable gap between the engineering education and humanities education. The universities and colleges should enable students to receive a wide range of training to broaden their knowledge, adjust their knowledge structure, and enhance their ability to solve complex problems in the engineering education. Moreover, as the ethical problems commonly lie in the process of the modern engineering activity,

how to develop and strengthen the education on engineering ethics should be an important topic in engineering education.

Under the background of the current social politics, economy, culture, technology, and education, the future talents should have such abilities as a solid foundation of knowledge, a wide range of knowledge, innovative spirit, practical ability, human qualities. Therefore, when setting the engineering curriculum system, we should pay special attention to the needs of the professional training objectives and the relationship between scientific theory and engineering to meet the basic needs of the training skills, enhance the students' engineering awareness, and cultivate high-quality engineering personnel.

C. Focusing on international cooperation and inter-school cooperation. The internationalization of engineering education is an inevitable result of economic globalization. The engineering education in the universities and colleges should make the students have more opportunities to acquire engineering knowledge and practice to fully prepare for the international competition. "With the rapid development of science and technology, the globalization is fundamentally changing the design, production, marketing, consumer and service patterns in all the countries' economy. The engineering has been pushed to the forefront of this development; the future development of the engineering would attract increasing international attention."[3] The higher engineering education should absorb the advantages of other countries to cultivate the students. The universities and colleges should carry out the international cooperation to train the engineering students to extend their international perspective, enhance their adaptable ability to different cultures, and strengthen their innovative ability.

At present, the level of higher engineering education in China is uneven. We do not only have Tsinghua University which is well known as the "cradle of the engineers", but also have lots of general engineering schools which have just a short history. Therefore, we should learn the experience of inter-school cooperation from foreign universities to conduct the regular inter-school exchanges and keep frequent contact between universities and colleges of engineering to achieve the training goal of the engineers. When learning from the reform of European and American countries in higher engineering education, the universities and colleges must also carry out the curriculum reform with Chinese characteristics to cultivate the engineering personnel and continuously push forward the reform of higher engineering education.

D. Cultivating the practical awareness and strengthen the school-enterprise cooperation. Establishing the practical awareness of the engineering professional is to make them generally recognize the importance concepts in the engineering activity, which concerns whether the personnel cultivated in higher engineering education are accord with the needs of society. From the point of the cultivating order of human capacity, there need to a successive process. The first step is to have the ability to receive knowledge; the second one is the ability to acquire knowledge independently; the third one is the ability to solve practical problems; and the fourth one is the ability to innovate. With the accumulation of knowledge and the improvement of learning skills improved, the students could shift his learning centre from the simple knowledge learning to the practical learning in the

learning process, participate in various practical activities frequently to apply their theoretical knowledge to the engineering activity and cultivate their ability to find out and solve the problems in practice.

Generally speaking, practice is essential, especially in engineering activity. The engineering training is an important part of engineering education and the key to training the engineering personnel. As a result, we should strengthen the school-enterprise cooperation. With the gradual development of the economy, more and more business organizations would like to take participated in the scientific research. The enterprises could deliver their research tasks to the universities and colleges by the school-enterprise cooperation and let the engineering students contact with the most advanced technological achievements, which would do well to their growth. After the schools had close ties with the enterprises, they would provide the students with more opportunities to practice. The enterprises can divide the engineering activity into small groups as the students' graduation design. That does not only make the students well trained, but also let them know the enterprises' products well.

E. Making the training system of the engineering education meet the need of the engineering industry. The Base of engineering education is to provide the students with the engineering training to cultivate their engineering consciousness and innovative ability. The students are able to complete some engineering activities by themselves to acquire a basic understanding of the production methods and processes in modern industry, receive the basic training on technology and management, and initially establish the engineering consciousness about markets, information, quality, cost, efficiency, safety and environment. The industrial centre in Hong Kong Polytechnic University has become the template for the construction of higher engineering training base in China. In China's mainland, Tsinghua University, Southeast University and other famous universities attach great importance to the construction of the engineering training base. So the governments and schools should try to increase their investment in engineering training base and establish some engineering practical bases with a complete range of advanced equipment, scientific management and high openness to provide the students with better environments and more opportunities to practice.

Enhancing the engineering training is the fundamental measure to improve the students' practical ability in engineering activity. To promote the professional practice in engineering activity, we could mainly make efforts from the three following aspects: First, we should emphasize on the students' participation in the research on engineering. Most of the research problems come from the practice. The students could use the professional knowledge and collaborate in teams to solve practical problems in the whole process of research. They could find out the actual problem and the new trend in the engineering by the participation in research, which is an early exercise for them to be in charge of an engineering activity independently. Second, we should promote the openness of the engineering training base. Then, the students could acquire plenary practical training and get more details about the engineering equipment and engineering process from products design to selling. Moreover, the engineering universities and colleges should not only make full use of their own engineering bases, but also actively open the

outside engineering base. Third, we should attach much importance to the graduation design. The graduation design is the students' first design work that demonstrates their practical ability. So the teachers should help and guide them as much as possible in the process of finishing their graduate design.

4 Conclusion

China's higher education must be in accord with the process of the engineering construction in China's economy. But the current situation is that the educational patterns, contexts and methods in engineering education are left far behind the development of engineering construction in China. Therefore, we should pay attention to the cultivation of the students' practical ability to enable them to receive the interdisciplinary engineering education. That does not only need to strengthen the inter-school cooperation and international cooperation, but also strengthen the school-enterprise cooperation to strive to make the training of the engineering students to meet the development of China's engineering construction.

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Concerning Clothing Design and Engineering Professional Education Reform

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Abstract. how to solve garment industry concepts backward, technological development ability weak market competitiveness, poor situation, the key lies in the clothing design and engineering education reform. Costume design and engineering education reform is through to the clothing market development process further demonstration and analysis, combining professional school characteristics, positioning for training can engage in more complex clothing design and engineering a line practical work of the applied talents.

Keywords: costume design and engineering construction reform goal.

1 Fashion Design and Engineering Cultivation Plan of Reform

Sure the talent training scheme of the dominant ideology is a demand as the guide, professional core ability as the goal, to develop professional technical ability as the main line, outstanding talents training pertinence, applied.

1.1 The Educational Targets

According to the social demand raises has basic theoretical knowledge and clothing in basic skills of morality, intelligence and physique, us overall development, competent for clothing enterprise design, hit the boards, making, technical advice, technical innovation work with "double certificate" high quality applied talents.

1.2 Talents Training Mode

According to fashion design and engineering professional talent, we established the production, study and research combining, diversity talent training mode.

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2 Teachers Team Construction Reform

In the team, with industry in teachers' qualification of teachers should reach 100%. From the enterprises and hiring part-time teachers, implement, improve school teachers ZhuanJian combination, to adapt to the change of the structure of professional requirements.

Increase the subject, academic leaders of the selection, training; Increase the strength of the foreign academic exchange teachers; Implement system of young teachers. Cultivating young teachers a teacher, teaching, the teaching process specifications, ensure the quality of teaching.

3 Teaching Content and Curriculum System Reform

Professional teaching position in training students' "to the plate making both technology and management mainly on" professional, practical ability to work and basic quality training as the main line, determined the clothing design and engineering teaching contents and curriculum system. To further strengthen the practice class system, strengthening students' practical ability effectively.

4 Teaching Methods and Teaching Means Reform

4.1 The Reform of Teaching Methods

Actively promote heuristic, should, guiding type, interactive, evaluation type, problems research type teaching methods. Theory and practice class mutual coordination and scene type, case analysis type teaching methods also widely used in teaching. The "double certificate" system, set up students' comprehensive quality assessment system.

4.2 The Teaching Method Reform

For the professional innovation and visual teaching features, use modern teaching requirements full-time teachers teaching means, improve the teaching effect. The practice of the traditional teaching methods and the multimedia teaching method, combining the teaching effect is remarkable.

5 The Practice Teaching Reform

By increasing the practical teaching process and the class hours and perfect practice teaching system, strengthening students' professional practice ability. Theory class hours and hours of practice for about 2:3 ratio. The school of "double teachers" and enterprise technical personnel to guide, training of speak and practice according to "speak 1 practice 4" arrangement, and in the light of the future position for intensive training.

Establish practice course assessment system alone. And these standards will permeate practice teaching and guidance, for all aspects of the "double certificate" assessment have laid a good foundation.

6 Teaching Conditions and Teaching Management Reform

6.1 The Practice Base Construction

Strengthen professional practice base construction. Practice bases is an important guarantee teaching work.

The students to participate through practical training base practice, greatly improving the students' practice and practice ability, practice time guaranteed internship effect is good.

6.2 Materials and Books Data Construction

To strengthen the construction of teaching material, make the construction of teaching material do make up, choose pay equal attention to, has written the applicability of the school-based features teaching material, meet the needs of the training plan, ensure that the overall optimization school books.

6.3 Teaching Management

Costume design and engineering colleges/universities to build two level teaching management system and professional construction regulations and establish the evaluation and examination system, and form a complete set of corresponding measures for the motivation to form an effective mechanism of competition. Established the student learning quality evaluation, teaching information feedback, the teaching management system, and according to the system implementation. Professional teaching files to a complete range, tidy up the standard.

7 The Quality of Teaching Reform

7.1 The Basic Theory and Basic Skills

Through the clothing design and engineering theory learning and professional skill training, student's actual knowledge, ability and quality structure with training target requirements. To achieve this major, bachelor degree level requirements.

In theory teaching and work out the students to master the knowledge, ability points. Increase elective courses, and the optimization and updating the teaching contents, broaden the students' knowledge, to solidify a certain theoretical basis.

7.2 Graduation Design (Paper)

The level of graduation design can directly reflect a professional teaching level, adhere to the "costume design, production, show the holy trinity" of graduation design mode.

8 The Professional Characteristics Reform

Will "double certificate" system into talents training target, allowing "double certificate" work institutionalization.

The "costume design, production, show the holy trinity" of graduation design mode. The employment as the guidance, focusing on the production line for a training practice ability and practice ability strong applied talents.

Adhere to the "of literacy class exam and clothing production add try the" combination of admission mode. New To ensure the quality of the students and graduates play a good role.

9 Conclusion

Concise distinct clothing design and engineering in the characteristics of a school, clothing design and engineering professional education reform need. Through the education reform can develop in clothing design and engineering a line actual applied talents for our country, by clothing becomes dress powers should do we make our contribution.

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In JiLin Province Native Products Brand Design Thinking

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Abstract. brand design enterprise image is the social public to the enterprise overall impression and feelings, through various import is image system (VI), such as enterprise sign, product brand and marketing strategy and enterprise culture construction to build up people feel and trust of the enterprise. To have good enterprise image in the social public, can establish in the fierce competition, and won the social public figure and the recognition and support.

Keywords: product design enterprise image design (VI).

As from industrial society to the development of the information society, modern economies are from the product competition to brand competition era, set up the good brand image has become numerous enterprise can compete in the key to success. As is known to all in today's society, set up the product image design is as a commercial behavior plays a considerable social role, people contact products, and can leave deep impression, to a large extent depends on the product image design performance if you can guide the consumer, stimulate consumer desire to buy, make business and consumers in a way to resonate.

Due to the brand owners can depend on brand advantage constantly the acquisition of wealth, can use brand market KaiTaLi image KuoZhangLi, capital NaXuLi continuous development and promote, so we can see the value of the brand. This value we cannot like physical assets that way with physical form expression, but it can make the intangible asset of an enterprise expanded rapidly growing, and can be used as a commodities trading in the market. Modern commodity has entered the era of get market by brand, promote the enterprise must seek to win the market direction of the competitive advantage. Therefore, change enterprise operation concept and mechanism, set up the good enterprise brand image, spread the culture, make enterprise market marketing strategy, improve consumer and enterprise brand of the cognitive degree has become the development direction of the new enterprise competition and goals.

Brand design enterprise image is the social public to the enterprise overall impression and feelings, through various import is image system (VI), such as

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enterprise sign, product brand and marketing strategy and enterprise culture construction to build up people feel and trust of the enterprise. Now the increasingly fierce competition in the enterprise, set up the good enterprise image is the enterprise the competitive victory effective way. Some new enterprise or the new reform enterprise, in the enterprise image design, introduce advanced enterprise image system (VI), get a good effect. To have good enterprise image in the social public, can establish in the fierce competition, and won the social public figure and the recognition and support. Brand promotion the brand is to market to the public, it is the ultimate purpose of the brand construction service to consumers: brand so as to realize the value of the brand, the promotion of brand of the moment is ready prophase work of matting, it will prompt consumers to buy the product the decision. Now most enterprises have been known to set up some brand and image. Have the brand and how to promote? Especially many of small and medium-sized enterprises how to use of the limited resources, in the market do brand promotion. Consumer product, the brand is to produce the product enterprise comprehensive feeling, have the quality of the products, the characteristic, the enterprise image, the service level, enterprise concept, the affinity of enterprise and so on, it contains enterprise the macroscopic and microscopic aspects, form of enterprise and products consumers nuanced psychological feeling. Brand such as people, must be have character. Otherwise, it will be difficult to cause the attention of consumer. The brand is not only external symbols, such as packaging, trademark, such as identification, have the value of a business concept and culture connotation fusion in content and form, is perfect and unified.

Native products brand construction is a system engineering, including all the surface, embodied in: brand, brand or design principle, brand portfolio strategy, the ownership of the brand, brand extension, brand update and brand protection DuoGe aspects. The purpose of the enterprise brand design is actually to the brand into the brand image to promote individual, and as a representative of jilin province native products for five plus families-ginseng ginseng plants of the genus is famous in the world of Chinese traditional medicine, known as the "king of the tea," it's magical effect has been recognized, one thousand years, for the health of human beings made outstanding contributions. It was beautiful, kind, peaceful, health and long life of pronoun, ginseng is deeply into People's Daily life in the northeast of the triple gem "." Jilin ginseng is the world of d. major production, of the national and the world were 85% and 70%. Ginseng exports more than 60% of world exports. Jilin province of grain is ginseng, mainly in baishan, the yanbian, tonghua, jilin city (state) 14 counties. Ginseng is an important source of local fiscal revenue, is the main way of getting rich farmers. Jilin ginseng industry development has the advantageous resources, with extensive mass base, have strong technical force, has the good processing equipment, high quality product, has the stable processing sales channel, have outstanding management talent. China is a big country, ginseng yield production and accounts for about 85% of the world's total output, is now one of the larger Chinese exports varieties. Can say, the world ginseng in China, the Chinese see jilin ginseng has become a gorgeous of jilin province card. Jilin province government to integration and development resources, development and growth of the prop, the characteristic advantage

industry, cultivate with independent intellectual property rights brand products gave high attention and trust. After the province and the industry of resources integration, China guerin "changbai mountain ginseng" brand product for one year, good health is happy, constantly, continuously improve product awareness, market development, scope expanding sales share grows day by day, the brand effect gradually revealed, and made a good beginning. Jilin province to build the "changbai mountain ginseng" brand. Through the unified production standards, strengthen the standardized production base construction, strong and help industries in the leading enterprise, increase the industry technology innovation and improvement, to research and development the ginseng series products deep processing measures such as gradually formed "changbai mountain ginseng" complete industrial assembly line of effective connection. With the ascension of the brand and product quality system consummation, jilin "changbai mountain ginseng" has already formed the production and marketing of two popular good things. Ginseng is an important characteristic of jilin province resources. Revitalization of ginseng to the industry, the economic development of the province is of great significance. Insist on planting standardization, the quality standardization, processing pure deepening, intensive industry, construction of standardized production base, foster and strengthen as the leading enterprises, strengthen technology research and development and the transformation of the achievements, the implementation of brand strategy, strengthen the industry standard system construction and market supervision, and construction changbai mountain of ginseng culture.

In emphasizing personalized life today, consumers choose brand is actually a choice of life advocates, life attitude, show personalities. The brand is designed performance brand image, only for the public accepted and approved, the design itself is a perfect communication with life. To consumers as the center to do: accurate market positioning. If the target market does not understand, brand design is "tilt at windmills. Efforts to meet the needs of the consumers. The needs of the customer is the enterprise all activities including brand design the starting point and the home for. Try to respect the local custom of the consumers. The correct guidance of the concept of consumers. To consumers as the center is not all that caters to the consumer's needs, the company insists on the principle of self, scientific and reasonable guide is brand design ability.

Brand design already was the modern business enterprise the embodiment of the value, also is the enterprise survival and development of a promotion. In the quality of products, price and function are similar cases, brand design became the only can dominate consumption indispensable factors, so will the formation of design of the product in the competition, the design of the dominant brand, so consumer is fresh and distinguishing combinations will choose the excellent product quality is the essence of the brand, brand, is fundamental to the life. The image is brand in the market, and the consumer heart showed what individual character characteristic, which reflects consumer brand evaluation and cognition; Cultural value is the brand of meaning, and it is the social material form and spirit form, the unity of the modern society is the consumption psychology and cultural value orientation of effective combination. With the market competition of the increasingly edgy, enterprise

competition is the performance for the product competition to brand design from competition.

So, the brand related to the survival and development of enterprise, the more related to enterprises in market competition can long; Whether for enterprise design conforms to modern social environment of good brand image has become many enterprise consider problems, whether the enterprise brand of up to values; Whether can in the social and economic competition and achieved the success of the maximum benefit, is worth further study of and development.

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On the Status and Significance of Education on Engineering Ethics in Engineering Education

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Abstract. Nowadays, more and more engineering educations and researches would no longer be social activity that is external to the production, but would be a necessary part of the expanded production process. As a result, the ethical considerations and conflicts often appear in the course of the whole project all the time. Ethical issues run through all stages of project activities from design, manufacturing to use. Education on engineering ethics is an integral part of engineering education, an inherent requirement of improving the overall quality of engineering students, an need for the integration with the international engineering education and an need for comprehensive development of engineering education. It can help us promote the implementation of scientific concept of development and achieve sustainable development.

Keywords: Education on engineering ethics, Engineering education, Overall quality, Scientific concept of development.

1 Introduction

The reason why we should carry out education on engineering ethics in higher engineering education is that engineering activity is a complex system which often has multi-element, multi-variable and multi-aspect. Its main characteristic is systemic thinking and systemic methodology. That is to say, when in the process of engineering activity, we do not only need to think in a technical way, but also ought to take the human ethical values into consideration rationally from the domains of society, culture and environment. We should do the research on the relationship between the whole and the part, structure and function, humanity and ecology, society and nature relations within the system, so that we could make us take technical and economic factors into account as well as social and cultural factors in the engineering activity to highlight the social ethical responsibility of engineering.

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2 Education on Engineering Ethics Is an Integral Part of Engineering Education

At present, engineering education and research would no longer be social activity that is external to the production, but would be a necessary part of the expanded production process. The integration of engineering education, research and production requires the engineering schools to carry out the relative reform on social function and the manner of running schools. Engineering schools should not only take the responsibility to personnel training and the development of technology, but also should be involved the research in new industries and new products to provide a variety of technical education to the enterprise. They ought to develop a variety of open consortium of education, scientific research and production, do the co-education, and help students to establish a noble purpose in life, lofty ideals and correct values of life in the process of social practice. That could make them work efficiently in engineering decision-making, design, testing, construction and management in the cooperation between the brain and the computer, take the "enhancing human well-being" as their duty, and take up the corresponding moral responsibility. In this context, education on engineering ethics is an integral part of engineering education.

Engineering, regarded as a method of analyzing and solving problems (such as quantitative analysis, model method, experimental method, design method, etc.), would further spread to all areas of social life, such as environmental engineering, social engineering. The engineering university in such a social context is not only the producer of the talents and scientific and technological achievements, but also the shaper of the new social life. According to this context, the personnel who have trained in engineering education ought to put the engineering issue into the whole social system to carry out ethical, political, legal, have the right value view and ethical care, environmental, psychological, comprehensive analysis and management, and bear the social ethical responsibility of engineering. Therefore, the education on engineering ethics is indispensable.

Education on engineering ethics should have a critical reflection on the ethical values and behaviors of the engineers to reveal the underlying moral basis. The general moral principles in the process of reasoning explicitly or implicitly have directly relationship with the ethical theories. Education on engineering ethics is an interdisciplinary project that requires a variety of information and knowledge from relative subjects. More importantly, the unique characteristic of the engineer, the organizational circumstance of engineering activities and the enormous and serious consequences that are caused by engineering to the personal, social and natural have forced the ethics to reflect and adjust, often made engineering ethics be able to form their own perspective and make its unique theoretical contribution to the world. For example, education on engineering ethics could provide new fruitful knowledge for the philosophy and ethics that think and debate on the essence of the individual and collective responsibility, the bound of the legitimate authority and individual freedom, the value of free market economic system in a long term.

3 Carrying Out Education on Engineering Ethics Is the Inherent Requirement for Improving the Overall Quality of Engineering Students

We have conducted a questionnaire survey among freshmen in the university. One of the issues is "do you know what the engineering ethics is as an engineering student?" More than ninety percent of them know nothing about engineering ethics. However, the International Conference on the Quality regarded the moral qualities as will be necessary as the modern engineer one of the eight indispensable qualities (the other seven were positively acting, pioneering spirit, adaptable ability, solid foundation, learning ability, varieties of expertise, collaboration ability). This is in stark contrast with the situation of engineering students.

The reason why we ought to attach more importance to ethical education to the engineering staff is that only in this way could we solve the urgent problems in the traditional engineering education efficiently. One of the problems is that the innovation, professionalism, teamwork, communication skills, learning ability, and engineering ethics to which are often attached great importance by the business communities failed to train and form effectively by virtue of higher education. Yingluo Wang, as an academician of Chinese Academy of Engineering and an professor of Xi'an Jiaotong University, has pointed out the main existing problems in Chinese traditional engineering education: students used to imitate rather than innovate in the aspect of design; their design patterns rely on rigid design rather than flexible equipment manufacturing system design; they pay more attention to the technical research rather than the design research on the structure and function; the content of education is only limited to the technical level, engineering students do not know the knowledge of cost, operation, management, and especially in the lack of humanity cultivation, comprehensive thinking and innovative design capacity. One of the important aspects in “humanity cultivation” is to improve the engineering students’ quality in ethics and professional morality. Strengthening the research on education on engineering ethics can help us create the teaching conditions for improving the overall quality of engineering students.

It is said that China is the largest building site in the world. A great number of projects have been started each year in China. The department of engineering becomes popular in colleges and universities, but the engineering ethics that is relatively prevailing in the international is still in the weak links.

In the 50th Anniversary held by a national-renowned Shanghai Geotechnical Engineering Investigation Institute, there was a highly respectable Academician of Engineering who was invited to give an academic report. He said that engineering ethics had been opened in the U.S nine top American universities and colleges of engineering. However, this course is still a novelty in China. In my opinion, the students in the universities and colleges of engineering do not need to study the correlative technology but also the engineering ethics. Needless to say, once the modern major project fails, it would cause great social and environmental loses. These failures are caused by the technological reasons as well as by the human factors, especially by the engineers’ factors.[1]

The education on engineering ethics is an intersect course on humanities education and engineering education. In current China, the engineering students have an urgent need for the education on engineering ethics in order to master the basic principles by which they could made the social evaluation and moral evaluation on modern engineering activities. Carrying out moral and ethical education to the college students is an important way to improve their overall quality, especially in their quality of engineering ethics.

4 Carrying Out Education on Engineering Ethics Could Help Us to Promote the Implementation of the Scientific Concept of Development

Engineering activity does not have great impact on the social and public life but also on the future of mankind. From the viewpoint of Academician Xiangwan Du, the essential qualities of the engineers include the followings: good analytical skill, flexible practical skill, creative skill, communication skill, business management skill, good professional ethics, and lifelong learning ability. On the one hand, carrying out education on engineering ethics can improve the moral qualities of the college students. On the other hand, it can help us implement the scientific concept of development and achieve sustainable social development.

From this point of view, we must fully implement the concept of people-oriented scientific and concept of development in the engineering activity. Specifically speaking, we ought to thoroughly think over the scientific, technical, ethical, economic, political, cultural and other factors, and correctly understand the impact on society and nature by the engineering activity and the social responsibility of the engineer to construct the resource-saving and environment-friendly society. We also ought to do the work of project decision-making, design, construction, operation and management with the guidance of the correct engineering concepts and reflect the core concept of the harmonious development between human and nature to promote the implementation of scientific concept of development. Strengthening the education on engineering ethics could help us to promote the implementation of scientific concept of development and achieve the sustainable development.

5 Carrying Out Education on Engineering Ethics in China Is the Need for Being Compatible with the International Standards of Engineering Education

Engineering ethics is a kind of rational thinking made by the engineering education practitioners in the world and a response to which the science and technology have increasing impact on human life and environment. In the context of economic globalization, today's engineering education needs to have the international vision, be accord with international standards and require the integration of Chinese concept of engineering education and that of other countries.

The engineering ethics is a compulsory subject in other countries' institutes of engineering. It is an important part of the engineering education. The education on engineering ethics had already appeared in the directory of the American college courses in the late 1960s. Since 1996, the test for a registered engineer in America has included the content of engineering ethics.[2] The education on engineering ethics can help students identify and discuss the ethical issues, make the ethical thinking, and make their own judgments and choices on the ethical issues in the engineering activity. The general engineering colleges carry out education on engineering ethics in two main ways: the first one is to set a course separately and get the students together to teach. For example, the MIT has developed a complete course of engineering ethics which is elective. The students can read the correlative books and discuss the cases to students to deeply study the problems of engineering ethics in the class. The second one is to organically integrate such ethical issues as engineering introduction, senior design and graduate design and use the curriculum integration to achieve organic infiltration. That is to say, the cases of engineering ethics that is closely related to the technical content should be distributed throughout the entire process of the courses.

6 Carrying Out Education on Engineering Ethics Has Great Significance of Strengthening on the Overall Engineering Education

With the rapid development of China's modernization, the professional ethics of the engineering staff are becoming increasingly prominent. To train the responsible engineering and technical personnel to meet the needs of society, universities and colleges must carry out the education on engineering ethics to cultivate the students' professional responsibility, help them to understand the professional behavior and responsible way, analyze the practical issues with the integrated use of the ethical knowledge, develop their ethical sensitivity and good professional behavior, and establish the career aspirations for the promotion of social progress and "improvement of human well-being".

Engineering ethics education is an important part of engineering education and an important task in the process of social development. Generally speaking, ethical considerations and conflicts are always in the course of the whole project. Schinzinger and Martin have given a rather exhaustive list of the ethical issues in the engineering activity from design, manufacturing to appliance. [3] The engineering construction is a social activity with a particular purpose that has a huge impact on the human production and has close relations with human life, society and environment.

In China, the ethical considerations on production safety, public safety, environmental safety, food safety will be the hot issues of engineering ethics. The professional spirit and scientific attitude of the engineering and technical workers will continue to attract the masses' attention. The corresponding education on engineering ethics will be an important part of the engineering education to be taken seriously.

Therefore, we must pay attention to the engineering quality. The engineering quality does not only have technical factors, but also ethical considerations especially in closely related to the professional ethics of the engineering staff. The "rubbish "projects, such as Bridge faults, high-rise buildings collapse, have given us an alert. Engineers as designers of the engineering blueprint must have higher moral quality, behavior pattern, responsible sense that they could cultivate in the process of studying the engineering ethics. The engineering ethics is like the “purification” in the engineering activity and the “supervisor” of the engineers’ soul of so that the environment of the engineering construction would gradually be “pure” and “high-quality”.

As for the engineering staff, the engineering design and construction provide them the time and place for the cultivating and improvement of their personal moral quality. Therefore, the effectiveness of learning engineering ethics is to enable to make the engineering students form their own moral understanding and moral quality, establish their correct value orientation, definitude their professional obligation, form their lofty professional ideal, and cultivate their good professional ethics before graduation.

7 Conclusion

Modern engineering activity often has the characteristics of socialization. Modern engineering technology has greater and more complex impact on society and nature (including the benefits and risks). Therefore, the humanity education for engineers, particularly in the education on engineering ethics has becoming increasingly important. At present, engineering students have many vague and erroneous understandings in engineering technology, such as technology neutral theory, technocracy, obscurity in the engineers’ responsibilities, duties and moral bottom line. This situation is caused by many reasons, but the main one of them is the lack of education on engineering ethics education. Therefore, it is urgent for engineering universities and colleges to carry out the education on engineering ethics to promote the comprehensive development of engineering education.

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Training Innovative Quality in Engineering Education by the 'Incomplete' Study

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Abstract. The innovative quality is the most important characteristic of technicians. According to the requirement of engineering, an 'incomplete' study based on psychology is indicated firstly. The five factors of the innovative psychology course is described as innovation consciousness, innovation space, innovative personality, innovation resources and innovation thinking. Then the function mechanism of 'incomplete' study in innovation quality training is discussed in the view of the five factors. Finally, a few methods of implementation of this idea are introduced in the current education condition. These methods are from actual teaching activity and are effective in practice. They include teaching skills, teaching process and experiment equipments. This idea of 'incomplete' study will be helpful in the education innovation in China.

Keywords: incomplete, engineering education, innovation, psychology.

1 Introduction

Engineering education goal is to train a large number of engineering technicians with innovative ability and excellent characteristics adapting needs of social and economic development. The core of education is the cultivation of innovation quality. Many literatures have talked about measures of innovation cultivation, but the viewpoints focused on education system mostly, seldom on educational psychology. As is known to all, the practice of the education is the achievement of education psychology substantially. Implementing the principle of psychology in educational will lead to more effective teaching. This study suggests that innovative quality should be trained in engineering education by the 'incomplete' study which roots in psychological essence.

2 The Psychological Essence of Innovative Quality

The main function of psychological system is to control organism reflecting to reality adjustably. When an organism isn't adaptable to the environment development, the existed balance in psychological system will be broken. In order to establish new balance, the being in reality has to be altered. It is exact innovation.

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Therefore, in the view of psychological parenchyma, innovation is unique reconstruction and externalization of cognitive structure based on reactive psychology and integration of available factors in reality as well as knowledge and experience, etc.[1].

Innovative psychology course, which is composed of a few steps, is influenced by several factors, as shown in figure 1 below. After perceives contradictions(i.e. innovation space) between the original situation and development in reality, the subject obtains needs (i.e. innovation consciousness) to achieve alteration. This needs produce momentum (i.e. innovative personality), which helps to search for essential connection between original knowledge, experience and the changing factors(i.e. innovation resources). Then, based on this connection, a series of information processing is performed to complete innovative reorganization of cognitive structure(i.e. innovative thinking), namely the internalization innovation in mind. When the subject tries to externalize the thinking, which appears as innovative ability, innovation behaviour is created.

So an innovation process can be produced on condition that there is innovative spaces meantime innovation consciousness, innovative personality, innovative thinking, innovative ability and innovation resources are obtained by the subject. Cultivating engineering technicians with innovative quality has to start from this premise.

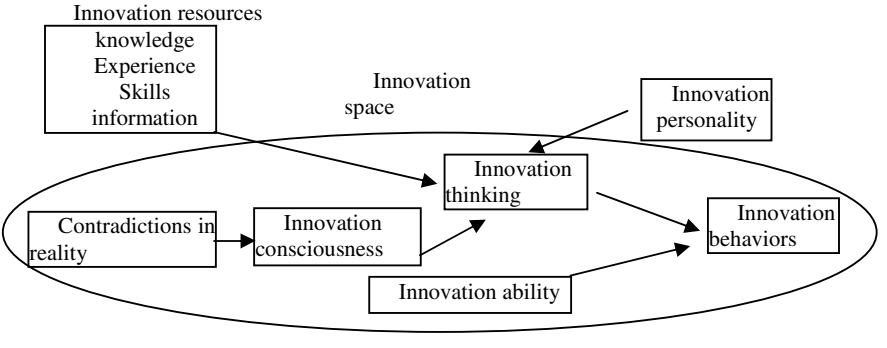

Fig. 1. The function of factors in the process of innovation

3 The Concept and Intension of 'Incomplete' Study

The 'incomplete' study is a teaching method described as follows: a teacher temporarily produces 'missing' or 'omission' of non-critical important content in teaching, then help students find contradiction which is from 'missing' or 'omission'. Thus innovation consciousness of students is stimulated and the source of contradiction will be found out by study. Finally the essence of knowledge is obtained by students.

The 'incomplete' study process is composed of five steps. In the first step innovative space is shown. The existence of the space leads to contradiction in

studying. Students will have a suspense in mind instinctively- why does the contradiction appear? This suspense will become activation of students' innovation consciousness with the proper guidance from the teacher. In the second step, the teacher, by instructions and hint, helps students recognize their suspense can be explained with the innovation resources and ability they own. Students will take their courage to innovate. The courage and the deciphering impulse of suspense constructs innovative personality temporarily. Then, students, interacting with the teacher to make out questions produced by the suspense, will design solving ways and complete the innovative thinking. This is the third step. Whereafter, under the indication from the teacher, students produce innovative solutions to the questions with the resources they own. It is the fourth step, namely innovation process. In the fifth step, the teacher should show encouragement and affirmation to students according to their acts in innovation, which brings them more confidence.

Innovative thinking and ability is trained in the 'incomplete' study while temporary innovative consciousness and personality is established. If the long-term 'incomplete' study can be applied scientifically, innovative thinking and ability will get significantly improvement. At the same time, short-term innovative consciousness and personality will be permanentized. Thus innovation quality of students is developed unconsciousnessly.

The 'incomplete' study is different from traditional 'problem' education. In 'problem' education the teacher shows questions initiatively[2], while in 'incomplete' study questions are raised by students after observation and analysis. The former is explicit questions, the latter is implicit questions, which is more suitable for technicians training. Though the problems in theoretical research are from issues in reality, they have been abstract and simplified. No matter how complex it is, the range it involves is relatively simple. However, what engineering technicians have to face is often not a question, but a problem group that involves multiple technology fields, the factors of which are both macro and micro. These intertwining factors usually infiltrate each other. Engineering technicians have to start their innovative work from assembling these factors to new simple questions after making them out. Therefore the base of engineering innovative quality is the ability of raising questions. Compared with the 'problem' education, the 'incomplete ' study, the feature of which is implicit question, can exercise innovative quality more effectively.

4 The Practice of 'Incomplete' Study

In the education system in existence in China, the following three methods of application of the 'incomplete' study can help students to train their innovative thinking, innovative personality and practical innovation ability separately so that improve their innovative quality partly.

4.1 Control Information Transmission Speed Reasonably

The process of Theory teaching is that of information transmission, the speed of which influences the effect of education. In the view of 'incomplete' study,

reasonable transmission speed will manufacture temporary incomplete content to train students' innovative thinking. For example, a teacher perform complex calculation or programming in a blackboard in an appropriate speed of writing. If he pauses for a while after finish writing a step, the next step, which has not been shown in the blackboard temporarily, will become the incomplete content. Students' brain is going to forecast the content instinctively. This brief forecast brings spaces for innovative thinking. So reasonable speed of information transmission in teaching is the simplest way to train innovative thinking.

It is more important to have a rational speed to play PPTs in teaching. It is not sensible to show intact calculation or program on one PPT for an instant. Otherwise such operation against the 'incomplete' study will deprive students of opportunities of innovative thinking training.

4.2 Hide a Few Specific Teaching Content Temporarily

Innovative personality, which exhibits strong motivation, tenacious consciousness and health emotion for innovation, plays a key role in innovative activity. it derives from courage to doubt. But in China, teaching contents has been authority for many years. Students, who are accustomed to accept teaching unconditionally, are lack of self-confidence and the courage to doubt. The growth of their innovative personality has been suppressed seriously.

So in order to develop innovative personality, it is necessary to help students have a habit of doubt in study. According to the idea of 'incomplete' study, a teacher might as well achieve a few omissions appropriately and guides students to cast doubt on the conclusions in teaching. Then the students' courage and self-confidence will be accumulated in the process that search for the omissions with the indication from the teacher. For example, while studying newton-leibniz formula in math class, the teacher can omit the premise of the formula intentionally and only explain how to apply this formula with some examples. Then makes students solve $\int_{-1}^{+1}\frac{dx}{x^2}$ with the formula, students will find the result conflicts with integral rule. They have to cast doubt on the teaching of the formula. At this time, the teacher accompanies students to search for the premise of newton-leibniz formula. After this study, the students will have a vague innermost idea like that 'authority can also be doubted'. Thus they have had the a little short-term confidence against the superstition of authority. However, it is a long-term process to build innovative personality in this way. So in order to shape innovative personality effectively, teachers should repeat the similar teaching process constantly and unawarely.

4.3 Remove the Unreasonable Package of Experimental Equipments

Engineering innovation ability, which is the most competitive ability for engineering technicians, derives from practical innovation ability[3]. Application of the idea of the 'incomplete' study in experiments can train practice innovation ability effectively. The application method is very simple: expand students' operation

range and let them deal with phenomena in experiments, which is not mentioned in textbooks and will become the 'incomplete' content for study, by themselves. This application method brings students opportunities of exploring and innovation. But in order to apply the 'incomplete' study, it is necessary to remove unreasonable package of experiment equipments. For example, many experimental equipment package is extremely 'perfect' : components of hardware are wrapped in enclosure except a few buttons and wiring outlets. Students can neither touch nor see them. In softwares, what students can operate is only several input dialogs, the parameters in which are also restrained strictly. These are visible packages. Moreover, there is an invisible package, namely the restrictions of content and process in experiments. The content is detailed and limited by experimental instructions strictly. What students can do in experiments is barely to operate following the experimental instructions. Besides, teachers pay full attention to students' behavior to stop any 'immoderate' operation which 'maybe' cause damage to the equipments. Thus, the whole experiment so 'complete' that not only students' innovation space but also innovation consciousness is vanished.

Therefore removing unreasonable package is the first step of application of the 'incomplete' study. Our college has had a certain result in this aspect. The design and experiment of comprehensive control of mechatronics and hydraulics has been combined since 2009. Students are required to complete theoretical design, assemble the mechanical device and verify the control effect in three weeks. The experiment equipments, which is designed by our teachers, are assemble with industrial components. In this experiment, the students have very wide range of operation, which includes wiring, design and assembling mechanical devices as well as programming in PLC, MCU or PC. What they get for reference is only product manuals. Teachers will give advices only when students ask for help. Many students said they got a little happiness from exploration and innovation in this experiment, compared with traditional experiments.

5 Summary

If the education system is the soil of innovation quality cultivation, the 'incomplete' study is one of the cultivative technikes. Suggests that teachers apply the idea of the 'incomplete' study dialectically in teaching to promote the innovation quality of students entirely and imperceptibly in rational scale and frequency. The idea of the 'incomplete' study will provide continual power of growth of innovation quality in engineering education in China with adequate patience and persistence pragmatically.

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Integrated Reform Research and Practice on Engineering Machinery Course

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Abstract. The curriculum is the teaching foundation, which is the basis to realize the teaching purpose. The curriculum construction is one of the profession infrastructures in university. The characteristic is the soul of the subject constructs, whose localization is one of the key links on specialty major construction. In this paper, according to engineering machinery's curriculum characteristic, undergoes many years' teaching explorations and the practice, a set of new engineering machinery theoretical teaching and the practice teaching system have been formed based on many kinds of method such as the reasonable arrangement course content, the optimization of teaching media and the method and conformity experiment content, and etc.

Keywords: engineering machinery curriculum, integrated reform, research, practice.

1 Introduction

The engineering machinery curriculum is one of the compulsory courses which studied by students of Mechanical Engineering and Automation major which is special major of national grade in our school, its discipline status is very important. The development of curriculum construction is a dynamic process, we must locate it targets based on the principle of market requirement and innovation. Only by according to social background, industry background, professional status and development trend, giving full play to existing teaching resources and potential advantage in school, further refining the characteristics, using favorable factors in the external environment and development opportunities, "differences in management strategy" can be achieved, market needs can be meet. It is significant topic the higher education scholar studies that how to seek out characteristic which is conformed to the actual situation in school to improve the quality of teaching and student's general quality and innovation ability obviously.

2 Educational Reform Origins

Because of engineering machinery's particularity, in the engineering machinery profession, the talented person is needed who has abilities not only the perfect technical theory but also the rich actual operation experience and professional dedication for hard work, the high-end and multi-skill engineering machinery

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talented person is scarcer, who needs to understand not only flows of production technology and processing, but also comprehensive knowledge including the business management, the human resources, the quality control, the equipment physical distribution, the cost control and so on.

Course of engineering machinery is a major basic course which closely integrates theory and practical, it has been listed as the main course in the major of mechanical engineering and automation from the time the curriculum beginning to the present. The course is not only the important foundation for study of the following curriculum and work after graduation, but also has unique position in the training of practical ability and the overall quality aspects of students. In recent years, engineering mechanical curriculum research and education reform practice reform have not interrupted, how to combine course teaching of higher education institutions with engineering education model of CDIO has been the focus of academic problems.

Some contents are obsolete and need to reform very much in the engineering machinery curriculum, it is also one of the causes we study the course. Along with the science development, some contents are obsolescence of knowledge in the teaching material; some contents have become the general knowledge, especially some of the new achievement of contemporary mechanical discipline which recognized very good already in the last ten years had not been reflected. There are imperfections exists in our teaching, it needs to revise and consummate quickly.

3 Contents of Educational Reform Research

The characteristic curriculum construction is a system involves various content, the construction content must revolve the characteristic the cultivation and the formation to adapt the teaching resources relevant and completes the corresponding teaching management work.

3.1 The Renewal of the Teaching Idea and the Curriculum Construct Concept

It is important strategic opportunity time on mechanical industrial development in our country during the 12th Five-Year plan, and critical phase that the mechanical industry realizes “from large to strong”, “the extension” the growth way continued many years has not been difficult to sustain; Industrial structure's is confronted with significant adjustment and the optimization which will ask for a higher request of talented person's quality and the skill level, it is absolute scarcity for the skill talented person specially the high quality and skill worker, which will become the shortcoming restricted sustained economy development and the competitiveness of enterprises. Therefore, the project education idea of CDIO has been applied in the engineering machinery educational reform.

3.2 The Establishment of Explicit Raise Goal and Science Reasonable Course Content

We divided engineering graduate's ability into three levels such as the engineering elementary knowledge, individual ability and the engineering system ability, and enabled the student achieve the predetermined target by the comprehensive raise way. In order to achieve this goal, the curriculum content had been made the adjustment correspondingly, which had been given prominence to ability training of special engineering machinery design and application maintenance of significant engineering equipment. The course content system had been carried on the full-scale reform; the content of "Engineering machinery" course had been carried out the organic conformity. From engineering machinery's basic principle, main structure, typical product, use and maintenance, failure diagnosis of typical mining machinery, the curriculum constructs had the relevant curriculum conformity, the scientific and rich characteristic curriculum optimized group had been formed. In the educational reform process, we construct the curriculum divide into two big modules: theory and practical application. "Engineering machinery design" and "Engineering machinery chassis" as well as "Mining and metallurgy electromechanical device service" had been implement the optimum composition, which forms the curriculum characteristic. The course content and the teaching effect had been praised by the colleagues and students after integration.

3.3 The Establishment of "Diversification" Teacher Team, and Construction of the Teaching Material Reinforcement

In the teachers construction, we had adopted "the individual construction" and "the community constructs" together, and trained and introduce famous teacher on the one hand, on the other hand, we had formed and optimized echelon structure to play the major role by "community" .By this way, we had established a reasonable structure curriculum construct team. University and college textbooks are an important tool in personnel training, selection of materials is the important conditions to ensure good teaching quality and the level improvement of training person.

3.4 Innovation of Teaching Method

Because of the conflict between increasing amount of knowledge and declining amount of teaching hours in class, the traditional teaching methods can not meet the teaching needs; it has become an effective way by using multimedia technology to improve teaching quality. Multimedia courseware help students understand the structure and principle of the device through a large number of machinery and equipment exhibition, by this way, the abstract knowledge has been simplified and visualized. In the limited time of teaching, the amount of information has greatly increased, it enhance the students interest in learning. We have also built a curriculum resource network station; it is a teaching assistant teaching site in daily. There are five functional modules mainly including the course profile, courseware, practice test, self-tests and online exchange.

4 Characteristics and Innovation

In the teaching reform, we focus on treating the relationship of c basic and advanced, strengthening the teaching content, improving teaching methodologies, dealing with coordination of traditional teaching methods and the application of modern educational technology and use modern teaching methods; we focus on dealing with the relationship between theory and practice, train students in the innovative spirit and practical ability, make the course construction systematic, scientific, modern, and gradually formed its own characteristics.

Course content and curriculum reform are agree with the target of the students training process, meet the requirements of personnel training in socio-economic and cultural development. To ensure that course content reflects the latest academic research and theory, we update teaching materials, teachers add new content in the teaching time to reflect the latest research results of subject areas in time to meet the social and economic development and academic development needs; we are in order to make the teaching content and curriculum of the training process to adapt the positioning to reflect personnel training requirements of national and machinery manufacturing industry. Practice teaching status was stressed in teaching plan. It emphasized practice teaching link's systematic characteristic, it has the practice teaching ways and means as well as the teaching goal in the whole and the chapter of curriculum. The practice teaching the content was arranged in the teaching material. In class, the teacher was advocated using the teaching method as heuristic and the Q/A type as well as discussion. The teachers paid great attention to utilize the modernization information technology method and the multimedia methods to displays student's study participation and innovation ability in class. We also added to the ratio of the questions of assessing students in creative thinking and using ability.

Course research was studied based on profits absorbed from other colleges and universities educational reform achievement foundation, we discuss the way of course content and reform by unifying experience of our teaching reality and practice. Simultaneously, we involved the psychological research of teach and study, and the relations between the related curriculums. We are having our effort to construct a new teaching system of tracing discipline front and manifests use value of theory, which will be helpful in raising the student practical and innovation ability.

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Innovative Research on Graduate Education Quality

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Abstract. The quality of graduate education is curial to the development of high education, which has been proved by the training process of our graduate education in thirty years. The continuous innovation of the education management ideas plays the leading role in the graduate quality improvement. Innovation in graduate instruction modes and exploration of the new laws of graduate education development are also curial to graduate quality improvement. The establishment of graduate education quality monitoring system, and the reform and innovation of graduate training are the guarantee of cultivating innovative talents. In the new situation of strengthening national self-directed innovation capability and accelerating establishment of national innovation system, the nation puts forward higher requests to graduate education quality. This article explored and researched ways to improve the training quality of graduates, from innovating education management concept, exploring new graduate guidance mode, establishing and perfecting quality control system.

Keywords: graduate, quality, innovation.

1 Introduction

It has been 30 years since the degree and graduate education of our country was established. Graduate degree has been founded with the continuous improvement in educational mode. In the same time the cultivating ability becomes stronger and the scale is enlarged. It has made remarkable contributions to the cultivation of innovative talents for China. Graduate education quality is an eternal theme in higher education development. Improving graduate education quality, promoting mode innovation and sustainable development of graduate education, are not only problems graduate training departments concern, but also requirements for enhancing national self-directed innovation ability and constructing the national innovation system to improve the quality of graduate training.

This paper studies and discusses how to innovate education management concept and graduate instruction mode, establish and perfect quality control system and ensure the training quality in the situation of graduate enrollment scale expands.

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2 The Innovation and Practice of Education Management Concept Are Bases of Improving the Graduate Quality

2.1 Creative Education Management Concept

In recent years, as the enrollment scale expands constantly, the system and pattern of graduate education management are also in change. The management system transits from relying too heavily on the control to a service mode gradually. Compared to the past executive orders management mode, the new mode is a service-type management platform reconstructed throughout the academic environment on the basis of tutor, graduate education and individual cultivation [1].

First, it needs to innovate training mode and enhance the service functions. When graduate education entered the popular stage of development, it has characteristics of the evident international trend, enhanced individualization of tutors and students and diverse group needs. Graduate education confronts with new challenges. Innovative management is the need of the graduate education popularization. Therefore, it is an important opportunity graduate education faced to change management concept and promote graduate education all-round developing, guided by the scientific development concept. The improvement of management service is also necessary for university to participate in international competition.

Secondly, management mode innovation is the urgent need of training mode. As the self-managed consciousness of tutor and graduate students increase constantly, they objectively remark on service quality of management departments by educational resources they enjoy. It brings particularity, exploration and innovation to the graduate training work, which prompts management departments to change their concepts and working methods. On the basis of the main body status of tutor and graduate clear, it needs to change management and managed relationship to a service and serviced cooperation relationship between them. Management departments should create good service environment for graduate training process.

2.2 Practice of Innovative Education Management

Graduate teaching management concept takes service as the forerunner. The innovation of management mode has also been gradually promoted in the process of exploration and practice for years. Here taking northwestern Polytechnical University as an example explores practice process of education management service.

Northwestern Polytechnical University constructs a graduate management service platform by modern network technology. The platform has "student space", "teacher space", "tutor space" and "comprehensive management" etc. Each student can register, record selection plan, inquire or print grades and apply for degree in his own "student space". The teacher can upload class arrangements and download schedules or students lists in "teacher space". The tutors can maintenance personal information in "tutor space". The first and second class teaching management member can carry out kinds of teaching management tasks in "comprehensive management", such as Internet enrollment, teaching management, degree management, etc. The college can

declare and upload various training information and teaching forms promptly, and send teaching documents and various notices to tutors via E-mail. Using the advantages of information management platform, it realizes centralized management, dispersed operations and data sharing, making traditional management transited to digital, paperless, intelligent, and comprehensive mode.

In the spirit of graduate education innovative engineering construction advocated by the ministry of education, Northwestern Polytechnical University boldly proposes graduate innovative ability training mode - "graduate innovative experiment center". It develops a new road for graduate education in the new situation. It is very popular in students and attracts wide attention and support of the leading department. By creating "graduate innovative experiment center", executing innovative management modes, encouraging graduate students self-design, free inquiry, DIY, independent innovation etc, it makes graduate students obtain plentiful innovative achievements. Currently there have been more than 1,000 innovative experimental projects conducted by graduate students in the lab. The university also sets up "doctoral dissertation innovation fund", "graduate seed fund" to encourage students to pursue innovative achievements.

3 The Innovation in Graduate Guidance Mode Is the Key to Promote the Graduate Quality

In the earlier of higher education, the graduate training mode is tutor's guidance combined with giving lessons. When graduate education enters large-scale stage, the enrollment conditions change from owning basic professional quality and ability to mastering systematically discipline knowledge. In recent years, the proportion of graduating students in the masters is increasing. The requests of teaching and the scientific research on graduate students become more professional. Tutors have found that most graduate students lack the ability to undertake research when they convey the basic knowledge in the class, which asks tutors to seek effective methods for remedy urgently. The purpose of advocating tutor responsible system is to make up the disparity between teaching effect and scientific ideas and introductory skills. It also makes graduate students form basic adaptability to professional research, stimulate their interests and normative motivation, and eventually engage in personalized study in a special research field under the tutor's guidance [2].

Tutor responsible system emphasizes the guidance firstly. The tutor is an introducer in graduate student's life, and he has responsibility to transfer knowledge, train students' scientific research abilities. Tutor's knowledge, moral characteristics and behaviors play a far-reaching influence on his students. Educational means of tutor responsible system mainly include literature reading, scientific discussion and research demonstration. These provide necessary knowledge accumulation and good experience to graduate students. Whether research discussion or problem-oriented conversation, has a formal or informal learning characteristic. Generally speaking, in the first year tutors only pay attention to introduction of scientific ideas, and organize discussion by informal meeting regularly, which are hosted by students themselves.

Research demonstration of tutor responsible system is ready to an official research for graduate students. It makes students form the correct understandings as well as thinking modes and work regulations that the scientific research requires. The guiding group cored with tutor gives demonstrative guidance in the literature reading, topic selection, opening report, paper plan and experiment to graduate students, which should be executed under the overall request of graduate training plan. According to the student's personal comprehensive characteristics, referring to his developing direction, tutor and his team choose one topic in the research directions already clear for graduate student, and formulate the training plan and implement it.

4 The Innovation of Quality Monitoring System Is the Guarantee of Graduate Education Quality

The establishment of quality monitoring system appears particularly important to solve downturn of graduate education quality. And quality of graduate degree thesis is the embodiment of education quality. Graduate students center on the degree thesis which has rigorous, scientific and innovative features in their entire learning process. To improve degree thesis level, it not only need to strengthen tutor responsible system, but also need to build a series of supervisory, eliminate regulations and long-effect mechanism to ensure the quality of graduate degree thesis improved steadily [3].

Selective examination papers and double-blind assessment system are executed. College selects a certain proportional papers randomly and sends them to teachers of other universities for double-blind assessment, which increases graduate students' urgency and make them pay more attention to thesis quality and writing process. Tutor's responsibility is strengthened and they will do guidance, examination and inspection more seriously and control the papers quality strictly.

Graduate education is an important part of higher education, and the new development situation of graduate education puts forward higher requests on graduate education work innovation. It is the meaning of graduate education management mode innovation to innovate graduate education management constantly, explore innovative guiding mode, perfect the graduate equality monitoring system, combine graduate students' technology ability training and ideological and moral education and pay attention to the cultivation of comprehensive ability and quality.

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Personnel Training Mode Renovation on the Tertiary Vocational Education and Training

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Abstract. The reform and renovation of personnel training mode is a hot issue in the tertiary vocational education development. Aiming at serving the society and employment-driven, tertiary VET follows the way combining the production and training, which is a must way for the tertiary VET development, putting forward the request on the personnel development through the cooperation between the school and enterprises. As a National Demonstration Tertiary VET College, in the personnel training mode, curriculum development, teachers' development and the training facility condition Chongqing Industry Polytechnic College has conducted a series of renovation and practice, which set up a successful example. Personnel Training Mode Renovation takes the specialty renovation and development as the core, which solved a range of difficulties in tertiary VET development.It has received the highly recognition from the enterprises and society.

Keywords: Tertiary Vocational Education and Training (VET), Personnel Training Mode, Renovation, Practices.

1 Introduction

Our tertiary vocational education and training (VET) is developing from the superficial construction to the deeply construction, quality improvement and society-service promotion. An important mark is the specialty construction and teaching reform of the tertiary sample construction colleges, featuring in the enterprise-school cooperation and on-the-job training, which aims at actively serving the regional economic development, the national industrial restructuring and updating needs and adapting to national requirements on the quality skilled person training. As a national sample college, Chongqing Industry Polytechnic College (CQIPC) has been carried out a serial of reforms and practices in the training mode, curriculum system, teachers' development, lab and practical resources, and solved a range of difficulties from tertiary VET development.

2 Renovate and Practice On-the-Job Training Mode

With the aim of reforming the curriculum and training modes and producing the qualified skillful persons, based upon the training modes "specialty-oriented,

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on-the-job training centered, customaries training, competency-based and employment ability-requested philosophy", CQIPC developed and practiced new training modes: One Combination with Three Parts which are competency standards, curriculum system and skill certificates and Three plus Two Job-training Alternatives, which means three-day on-campus studying and two-day industry practice per week, etc. During the process of job-training combination, the teaching reflects the features of practice, openness and professionism.

Based upon the industry and enterprises, renovating teaching content, methodologies and modes is the way to achieve the reform of skilled-person training mode. Through the industry investigation the teaching content has been selected and identified, which accords with the principle of being the most common and practical, and which the typical carrier, similar is also to or reflecting the enterprises' design and production. Each learning unit processes the features of practice, openness and professions. To the combination of theory and practice, the teaching mode is a process of "training and working", a process of "theory and practice" and a process of "classroom and workshop". This teaching mode provides students enough chances to conduct their training tasks. Students should be equipped with professional skills through the on-campus theoretical studies with practical training, basic skill practices, and professional skill practices; meanwhile, students should promote their comprehensive skills through the off-campus work-integrated learning, on-the-job internship and graduate design. The whole training process takes the workshop activities as the reference, with the goal of combining teaching, learning and producing to implement the three steps as planned practices with the analysis on the industry, productive practices on-campus and on-the-job practices. The graduates are ensured to be directly adapted to the enterprises, which achieved the zero gap among the school and enterprises, teaching and producing, training and employment.

Three plus Two training mode has been carried out in the hotel management specialty, which is a two-day theoretical study on campus and another three-day practice and training in the Intercontinental Hotel. The Intercontinental Hotel has involved in the whole process of training the students, formulating the training plan, combining the classroom with the real workshop, using the enterprise's standards as the training standards, providing the training equipment, offering the trainers. The enterprises have been playing an active role in providing a real workshop to achieve the goal competency-based training. Graduates are trained for the post without any gaps, with two awareness (recognition to the job and serving target), three core vocational skills (front-desk service, food and beverage service and housing service), and three competencies (dealing, management and creative ability).

The Automotive Test and Maintenance specialty aims to produce the automotive doctors. Enterprises and the college jointly set up the competency standards renovate and practice the new personnel training mode which combined competency standards, curriculum system and vocational certificates. With the effective use of competency standards, this specialty restructured the curriculum system in the automotive maintenance, automotive repair, and test and diagnosis, set up an

alternative pathway as Study-Work-Study; carry out the teaching plan in Seven Steps and use the Standard Mode to carry out the curriculum assessment.

3 Restructure the Curriculum System Featured with Three Correspondences

Through the investigation and analysis of the common problems existing in the Chongqing tertiary VET curriculum construction, a curriculum developing mode was formed, in which the Industry Coordinating Committees, enterprise professionals and the teachers jointly conduct the personnel-need investigation, task analysis, curriculum structure and content analysis and the teaching material development. This curriculum system has a feature of Three Correspondences.

Firstly, the curriculum system meets the personnel-requirements required by the corresponding industry and enterprises, ensuring the achievement of the quality skilled-person training target. Covering the courses of comprehensive employment skills, the courses of professional competencies and the courses of ability development, this structured curriculum system strengthened two sections: professional competencies and employment skills, with the aim of quality-personnel fostering. The professional competency trainings are conducted in the required courses of professional training courses, productive practices, on-the-job internship and graduate design, etc; the employment skill trainings are conducted in the required courses of comprehensive skill trainings partly with the optional courses, to the personnel quality development. Meanwhile, a program of Quality Education Construction was specifically set up in the format of comprehensive quality course classroom-teaching jointly with off-class practices, to facilitate students' skill updating, personality development and sustainable personal development.

Secondly, the curriculum system meets the position competency requirements, based on the competency-based training. During the curriculum development, the competency standards of each specialty accorded with the authorized standards, which ensures the combination of the real job and teaching contents, the correspondence of the learning and teaching contents, achieved the combination of the vocational standards with the curriculum system, theoretical teaching with practical teaching, enterprise culture with the campus environment.

Thirdly, the curriculum system reflects the production processing requirement, ensuring the combination of teaching, learning and producing. On the basis of renewing the curriculum conducting way to design a real working scene, the outcome of the students' works could be according with that in the real workshop, through the on-campus practicing, vacation practicing, and on-the-job internship.

4 Construct the Practice Training Base Jointly by College and Enterprises

Regarding the win-win as the starting point of the college-enterprise cooperation, a sustainably effective and cooperative mechanism of win-win has formed on the

basis that enterprises provide resources and college offers intelligence to jointly construct a cooperative workplace of training, production and management. Thus, a series of training workshops were established, including practice training centers, technique retraining centers for enterprise employees, technology application and replication bases, training and assessment centers for vocational skills, bases of production.

Taking the specialty of Mould Design and Manufacturing as the example, under the cooperative relationship with Chongqing Chiheng Mould Manufacturing Co. Ltd, a practical training base had set up on campus with the responsibility of production, sales and training, which had already become an example of college-enterprise cooperation; meanwhile, enterprises was also absorbed by our college schooling to provide their resources to construct the training organizations with college's intelligence. Lifan Group and Dongfeng Vehicle offered a number of equipments and respectively established their unique national designated training organizations, which are After-sale Tech Training Center of Lifan Vehicle and Dongfeng Vehicle Tech Training Center. To the enterprises' requirements, the college undertakes the task of training manual editing and also conducts the training tasks to the technique managers of over 1100 4S maintenance stations for Lifan Vehicle and Dongfeng Vehicle across the whole country; on another aspect, the new cooperative mode has others as the center, which means enterprise-centered to construct the practice bases. Taking the specialty of hotel management as the example, there is a strong relationship with the college and the enterprises, like Chongqing Yangtze Holiday Inn, JW Marriot Hotel and etc. The whole project has the enterprises as the center, which has the main responsibility to formulate the customized-training plan, conduct the implementation, and give evaluation and feedbacks. This cooperation effectively facilitated a training platform of on-the-spot teaching, productive training and management of on-the-job internship, solved the problems being hard to construct the atmosphere and environment of a real-workshop for the college, is target-oriented to produce the personnel with the international industry's needs, and is beneficial to increase the employability of graduates.

5 Systematically Implement the Development of Tertiary VET Teachers

The construction of tertiary VET teacher group should start with and focus on the quality updating of Duel Teachers, and the Duel-teacher structuring of the teaching team, the key of which is the development of vocational skills. With the analysis of teachers' competency elements, a system to develop teachers' vocational skills was set up, with three focuses: professional skills, teaching planning ability and teaching conducting ability. The implementation would be conducted through the way of work-integrated learning, and enterprise-retraining.

5.1 The Fostering of the Professional Skills

Qualifications and certificates are encouraged to obtain, such as, professional certificates for technical positions, qualifications as professional assessors, and training certificates of professional skills, etc.

A range of trainings of tertiary VET theory and teaching modes should be carried out as planned and by group. Assigning teachers to study the advanced VET concept and theories abroad would be helpful to strengthen the understanding VET features and rules, especially the understanding on the training target-group, specialty, courses and teaching process, and promote the educational levels.

5.2 The Fostering of the Teaching Planning Ability

Participating in the teaching activities of design and implementation is helpful for teachers to familiarize the process of understanding the skills required in detailed tasks and developing the courses with the theories of education and teaching, and also conducting the research on the practices.

5.3 The Fostering of the Teaching Conducting Ability

With the student-centered concept, a series of teaching actions lay in the steps of consulting, planning, making decisions, implementing, reviewing and evaluating. In the work-integrated practice, students could master the professional skills, theoretical knowledge and acquire the six general abilities. Teachers are required to acquire various teaching methods, including exploration learning, interactive learning, group discussion, case study, projects and other competency-based training. During the actual, teachers shall be able to organize different activities to the different target, according with the prior-knowledge, skills, attitude and interests.

For the new teachers, college has the duty to conduct the pre-job training, teachers' qualification training, professional skill training and teaching skill training. The focuses are on the teaching planning, classroom management, teaching delivery, professional skills, skill teaching and so on. A Three-year Career Development plan is drafted to achieve the Enrollment-Qualified-Updated to the new teachers.

6 Summary

The demonstration construction takes the specialty renovation and development as the core, which solved a range of difficulties in tertiary VET development. Its developed competency standards solved the problems between personnel training and standard professionals; restructured the curriculum system effectively meets the problems arising in the combination of the position and certificates; systematically designed and constructed practice system, comprehensive curriculum system balanced the proportion between practices and basic knowledge; the jointly developed curriculum and teaching materials took the enterprises' value as the reference, clarified the core of the curriculum training contents, and opened the

school's curriculum development to the industry, which also stimulated the promotion of other relevant curriculum development in and out of the city; the practice training base and management center jointly constructed provide a teaching environment similar to the real workshop. The new personnel training mode has greatly supported the competency-based training, promoted the quality of the personnel training and achieved a series of outcomes in the national teaching outcome demonstration, quality teaching groups, edit curriculum and material development and skill competitions, and meanwhile, it has received the highly recognition from the enterprises and society.

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The Whole Discrete Actuarial Model of Life Insurance with the Interest Rate Obeying Uniform Distribution

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Abstract. With the development of Chinese insurance industry, actuarial models of life insurance with stochastic interest rate are concerned by more and more scholars. In this paper, a series of problems about level net premium, future loss and reserve of n -years terms insurance are proposed with the interest rate obeying uniform distribution. Meanwhile, it combines with life table to analysis of influence about insurance companies and insurance applicant with different term insurance. It could get the risk of insurance companies decreased gradually along with the growth of term insurance period. The model provides a method to appropriately measure the risk for the life insurance companies.

Keywords: rate, uniform distribution, actuarial model.

1 Introduction

Insurance as a part of the financial industry is essential to the economic development of an industry, but the insurance industry has risk. And the risk is influenced by interest rate, mortality rate and premium. Life insurance as an important type of the insurance industry in rapid development of era, the scientific research is very important.

In the proposed actuarial models of life insurance were based on the continuous changes an interest force accumulation function to study. Such as Free (1990) [1] and Norberg (1991) [2] studied computing problems on the completely discrete reserve of life insurance policies. Wenjiong He , Qingrong Jiang (1998) [3] studied model about an interest force accumulation function with a Gauss process and obtained increase endowment insurance immediate payment of each moments. Liyan Wang , Yali Hao, Haijiao Zhang (2010) [4] proposed endowment insurance model about an interest force accumulation function with Brownian motion combined with Poisson process and got the policy value formula, and utilized mortality rate obeying uniform distribution hypothesis to simplifying formula. In many based on the former research, the paper utilized a series of problems about the different term insurance were analyzed in the case. It got the trend of level net premium, future loss and reserve on term insurance. It has the practical application to predict the risk of the insurance companies.

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2 Establishment of Model with the Interest Rate Obeying Uniform Distribution

Assuming each the annual interest rate is different. We denote it by $i_t (t = 1,2,\cdots)$.Then end of year of death payment a unit of insurance amount of present value in the k end-year for $\prod_{t=0}^{k}(1+i_t)^{-1}$, $(k = 0,1,2,\cdots)$

Hypothesis $i_t \sim U(0.03, 0.05)$, then we have

$$E((1+i_t)^{-1}) = \int_{0.03}^{0.05}(1+i_t)^{-1}\frac{1}{0.05-0.03}di_t = 0.961 \tag{1}$$

And noted it for $E((1+i_t)^{-1})$=m ,

We had the corresponding level net premium with the interest rate obeying uniform distribution for

$$\begin{aligned} P(A_{x:\overline{n}|}) &= \frac{A^1_{x:\overline{n}|}}{\ddot{a}^1_{x:\overline{n}|}} = \frac{E_{i_t}E_T(\prod_{t=0}^{k}(1+i_t)^{-1})}{E_{i_t}E_T(\ddot{a}_{\overline{T}|})} \\ &= \frac{\sum_{k=0}^{n-1}{}_kp_x q_{x+k}E(\prod_{t=0}^{k}(1+i_t)^{-1})}{1+\sum_{k=1}^{n-1}E(\prod_{t=0}^{k-1}(1+i_t)^{-1})\,{}_kp_x} = \frac{\sum_{k=0}^{n-1}{}_kp_x q_{x+k}m^{k+1}}{1+\sum_{k=1}^{n-1}{}_kp_x m^k} \end{aligned} \tag{2}$$

We got the loss of insurance companies in the k year with the interest rate obeying uniform distribution for

$$\begin{aligned} L &= E(\prod_{t=0}^{k-1}(1+i_t)^{-1}) - p(A^1_{x:\overline{n}|})\ddot{a}_{\overline{k}|} \\ &= m^k - \frac{\sum_{k=0}^{n-1}{}_kp_x q_{x+k}m^{k+1}}{1+\sum_{k=1}^{n-1}{}_kp_x m^k}[1+\sum_{l=1}^{k-1}\prod_{t=0}^{l-1}E((1+i_t)^{-1})] \\ &= m^k - \frac{\sum_{k=0}^{n-1}{}_kp_x q_{x+k}m^{k+1}}{1+\sum_{k=1}^{n-1}{}_kp_x m^k} - (\frac{\sum_{k=0}^{n-1}{}_kp_x q_{x+k}m^{k+1}}{1+\sum_{k=1}^{n-1}{}_kp_x m^k})[\frac{m_1(1-m^{k-1})}{1-m}] \end{aligned} \tag{3}$$

We gained (x) insured a unit of insurance amount of n-year term insurance reserve in the t end-year with the interest rate obeying uniform distribution for

$$
\begin{aligned}
{}_tV_x &= A^1_{x+t:\overline{n-t}|} - P(A^1_{x:\overline{n}|})\ddot{a}^1_{x+t:\overline{n-t}|} \\
&= \sum_{k=0}^{n-t-1} {}_kp_{x+t}q_{x+t+k}m^{k+1} - \frac{\sum_{k=0}^{n-1} {}_kp_x q_{x+k} m^{k+1}}{1+\sum_{k=1}^{n-1} {}_kp_x m^k}\left(1+\sum_{k=1}^{n-t-1} {}_kp_{x+t}m^k\right)
\end{aligned} \tag{4}
$$

3 Analyze Case

Hypothesis insured age was 25.we utilized the former model combined with life table(2000-2003)(mixed men and women) to calculate level net premium, reserve and future loss of different terms insurance .The analytic results as shown in fig. 1.2.3.

This reflected level net premium variation trend of n -year term insurance with interest rate obeying uniform distribution. We could found level net premium increasing with the increase of term insurance period. This was corresponding with the mortality rate enlargement along with the age increasing. So insured also paid more premiums when he bought more long period term insurance.

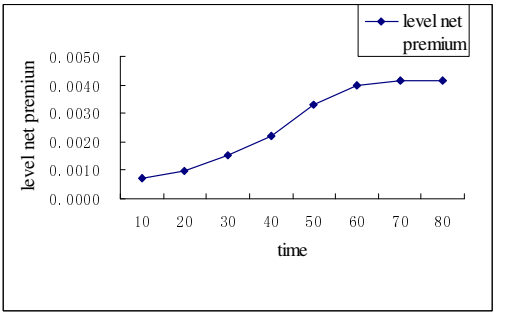

Fig. 1. (25)Level net premium of n-years term insurance.

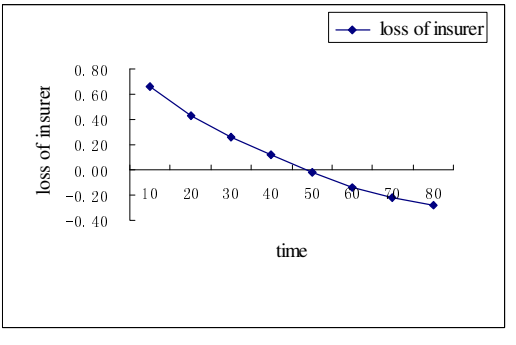

Fig. 2. (25)Loss of insurer on n-years term insurance.

This showed insurer loss variation trend of n-year term insurance with interest rate obeying uniform distribution. When the insured bought term insurance between10to50, loss of insurance companies was more deflected x-axis. It also declared insurance companies the possibility of is bigger. When the insured bought term insurance between50 to80, loss of insurance companies was below x-axis. It suggested that insurance companies the possibility of risk is smaller. Along with the increase of insured period, the insurance companies were basically profitability.

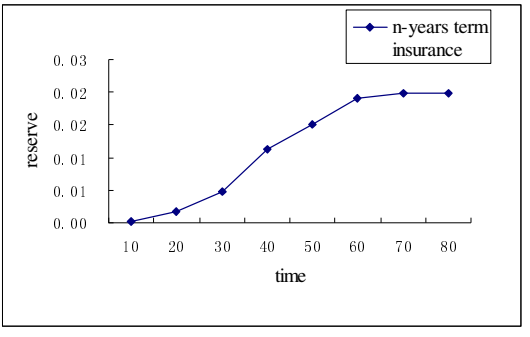

Fig. 3. End-year reserve of n-years term insurance.

This suggested that 5 end-year reserve variation trend of n-year term insurance with interest rate obeying uniform distribution. Along with the increase of insured period, the reserve was also growth. The result was corresponding with practice.

4 Summary

In this paper, it studied a series of problems related to the different period of term premium. We could get the increase of the insured payment pure premium along with the growth of term insurance period. Meanwhile, the risk of insurance companies decreased gradually. However, the possibility of insurance companies risk was enlarged when the insured age was increasing. And the reserve of insurance companies was also increasing. Therefore, it is important to forecast to the risk of insurance companies by interest rate.

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Research on Physical Education Reform from the Perspective of Physical Fitness

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Abstract. With the social and economic developing, "physical fitness", which is designed to train young people understanding the value of lifelong physical activity and developing healthy habits, has been integrated into the areas of Curriculum reform, and the health and exercise has become an important part of everyday life for college students. For it can enhance the communication between students and society, enhance the students understanding the lifelong physical education, physical fitness education must be reformed from curriculum, teaching content, teaching organizational and so on.

Keywords: Physical fitness education, College, PE courses, teaching reform.

1 Introduction

With the social and economic developing, The current international “physical fitness” as a major objective of health has been integrated into the teaching reform field and the physical fitness education has taken an more important play to guide the students exercise more actively, form an more healthy habits, and reflect a new trend of the college physical, that is lifelong physical education, and health of the individual[1].

With the further reform of quality education in china, quality education has become an important goal of current educational reform, especially of the reform of basic education, school sports is not only an important part of quality education, but also an important means of quality education. Teaching Program Issued by the Ministry of Education has implemented a new regulations and requirements from the nature of the seven aspects of PE curriculum reform, which is "health First, "people-oriented "," stimulate interest "," lifelong sports awareness and ability" and so on[2]. Therefore, the development of physical fitness will take a very important play in physical education and it will be designed to help students understand the value of lifelong physical activity, and develop healthy habits.

Development of physical fitness education will lead to the changes of teaching objectives, teaching content, teaching methods and teaching evaluation system, which is conducive to the process of the integrated teaching of class, is also conducive to the national student physical health[3], the smooth implementation and more conducive to promote the teaching of PE reform health into the future.

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2 Subjects and Methods

2.1 Subjects

The topic is focused on the fitness education and the teaching of PE. It has attempted to provide some basis for exploratory research of reform and development in physical education.

2.2 Methods

Literature and Comprehensive analysis of induction access to a wide range of areas relevant to the study of domestic, foreign technology results, latest developments, relevant policies and regulations, relevant data and information has been got. And through the analysis of Current status of Physical Education College, related to the actual data, it has provided proposals to promote the adjustment of college physical education reform[4].

3 Results and Analysis

3.1 Physical Fitness and the Significance of Educational Content

Physical fitness is a concept to describe the human body's ability to adapt to the environment. World Health Organization defines it as: In addition to coping with daily at work, people do not feel fatigue, and have the energy to enjoy leisure and deal with emergencies[5]. It is divided into sport related physical fitness, health related physical fitness and so on according to individual needs. Physical fitness education origins from H. PERD, which is aimed to help children understand the value of lifelong physical activity, meaning, and to develop healthy habits Education programs. The introduction of this plan, which is as the guiding ideology in American sports courses, teaching methods and means, is popular by the majority of teachers and parents of all ages. It reflects the life of the school physical education courses, personalized and healthy development of the new trend, which is consistent with China's Physical Education Curriculum requirements and the basic direction of development. It will have a profound impact on the teaching of physical education curriculum reform in China[6].

3.2 New "Syllabus" Objective of the Course and Nature of Sports

Understanding the nature of physical education correctly is the right direction to grasp the premise of physical education reform. From the new "syllabus", we should understand the objective of the course and nature of sports as following: (1) Teaching of Physical Education must implement the "health first " guiding ideology, promote the health services for students and take enhancing student health as the goal; (2) Teaching of Physical Education must take physical exercise as the main goal, but not based on knowledge transfer and intellectual games. (3) Physical education and health knowledge, skills and methods is not also the

main course contents, but also the main carrier. It is an important goal to master the knowledge, skills and methods as "Curriculum Standards" required. (4)Although the variety of content, multiple functions and the integration of multiple values is emphasized in PE and health curriculum, Teaching of Physical Education is still a course, which takes the sport as the main content and is closely related to the main study of health and physical education knowledge.

3.3 Necessity of Physical Fitness Education in Colleges and Universities

National Student Physical health monitoring has showed that physical health status of students are still declining in 2005[7]. It also mentioned that some physical indicators reflecting the vital capacity of lung function continues to decline with the prevalence of overweight and obesity continues to rise, students poor sight detection rate is still high.

There are many reasons leading to the declining, such as individual factors, social factors, family factors, school education and so on[8]. Particularly, we think the school physical education teaching takes an important part Formally, the lack of physical exercise, the lack of activities arrangements and the students own lack of hard lead to the declining. In essence, the one-sided understanding of the guiding ideology has lead to it. From above, we must be Pragmatic and practical results, and we Should always focus on "physical fitness " of education, taking enhancing student body as the main objective of Physical Education.

It is the ideological foundation to understand the comprehensive meaning of health. Curriculum Standards promote the World Health Organization concept of health education actively, namely, physical health, mental health and social adaptation. it has showed that teachings of other courses can not compare to the effect of teaching of physical education for promoting mental health and social adaptation, and paying attention to physical fitness, enhancing the student body, is still the focus of physical education[9].

Physical fitness, namely the life of the physical education curriculum and health of the individual, has reflected the trends of our PE curriculum development. Because of its consistency with the direction and purpose of physical education curriculum reform, we should take physical fitness education as an important content of the teaching of physical education and make it get the full interpretation in sports reform in college.

3.4 Inspiration of Physical Fitness Education for College Sports Reform

3.4.1 Meet the Individual Needs of Students, Providing a Theoretical Basis and Support

With the development of the requirement that meet for the social development, it has become an inevitable trend to meet the educational needs of the individual object. The appearance of physical fitness has provided a theoretical material for

the individual needs of students. In fact, physical fitness has made a partition for sports and health according to the needs of each person, which is an important part and purpose of physical education. According to the division, physical fitness can be divided into exercise and health, while the former has to be divided into as the following: (1) high level sports teams, which is the expansion of physical education curriculum, which is decided by their objectives (training and match the task). (2) training courses, classes or clubs to improve. Which is a sport for those who have talent or are interested in sports than the general level of quality students, and because of their relatively more higher point, they can not accept the basic sports courses step by step[10]. Based on their school (or a degree per year) medical and physical tests, classification of physical fitness should be divided. The body (such as obesity, a disability or a disease, etc.) and psychological (eg depression, anxiety or a mental illness, etc.) the more specific groups should also be fully aware in the division.

The classification of physical fitness, that through different forms of teaching content and teaching to help different physical conditions and movement-based students achieve different goals, could make the teaching goals more delicate, more emphasis on individual students, So that the physical education teaching could reach a more personalized direction.

3.4.2 Make the Teaching Contents, Teaching Form and Evaluation Criteria More Scientific and Flexible

Guiding ideology of class decides the course content and form. Based on the needs of students, physical fitness education provides different teaching for different students according to the actual situation of each student, so firstly, it could help students break the psychological fear to the physical teaching and secondly help them re-recognize and make use of health resources secondly. Finally the students could learn the sports actively. With Changes of teaching ideas, both teaching and learning could interact each other organically and reach reasonable direction.

As an internationally recognized fitness standards, physical fitness, which contains the contents in physical function, physical and other aspects , also presented in line with our new "standard"[4], both them have a common core idea, that is "Health and Health Promotion", which makes important changes in in thought and contents of the physical education curriculum in the assessment of student achievement. Because of above, the focus will change from "a ruler", "a stopwatch" "a height " and "an action" to "individual needs ", "reasonable body composition" and "to enhance the efficiency of learning", which makes the failure of students because of "0.1s"or"1cm" not occur any more.

4 Conclusions and Suggestions

4.1 Conclusions

The results of many physique investigations in our country show that the trends that confusing the purposes and tasks of School Sports and Mass Sports, the

reducing of standards of college students' physique can not be neglected. Because they will lead to the decline of morphological and physiological functions of college students, which will finally make their physical quality reduced.

With the development of society and laws of itself, School Sports is under the stage of reforming. The aim of higher education fully implementing the education policy of our country, offering qualified and all round development graduates for the society can be realized only through the continuous innovation of school physical education.

Physical Fitness reflects only one aspect of the physical education in university. However, it connects tightly with the aim, teaching pattern and content of physical education in university.

4.2 Suggestions

The idea that physical fitness should be lifelong, individualized and healthy has great significance on the curriculum reform of physical education in university. According to the requirement of quality education about it, the following suggestions are put forward:(1)Study and carry out the teaching aim of physical education in "National Ordinary College Sports Teaching Instruction Summary". Realize fully the importance of improving the health of youth. Make sure the "National Ordinary College Sports Teaching Instruction Summary" and "Rules and Regulations of School Physical Education" be carried out through supervision. And make sure each student has an hour's physical fitness activities with certain sports load.(2)The aim of physical education should be set not only in the stage of school but in the long run so as to lay a good foundation for the life-long sports. All the students should be taken into consideration to make them healthy both in physically and emotionally. The attitude and feeling of the students toward sports should be paid more attention to in the physical education class in university and the habit of taking part in sports voluntarily should be cultivated.(3)The main content of physical education class should be the knowledge about bodybuilding and sports which can be done in one's whole-life. The teaching method should be helpful to realizing the aim of life-long sport. The assessment toward the students should combine the ordinary standard with the characteristics of the individual, and the assessment to the students' improvement should be paid more attention to.

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The Exploration of Sino-German Cooperation Training Mode for Electrical Engineering Education

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Abstract. This paper introduces a kind of the Sino-German cooperation-training mode for the electrical engineering education. It deals with the cooperation project background, the goal for applied talents education, and the characteristics of tanning mode. It expatiates the exploring procedure, including making the curriculum, organizing class teaching, emphasizing on lab teaching, paying attention to internship, and attaching important to bachelor thesis. It also describes how to guarantee the quality for this kind of engineering education tanning mode. The practice of the Sino-German cooperation for the electrical engineering education has got effective achievements. Many undergraduates as electrical engineers who can speak German language have been very welcome in the enterprises. It can provide some experiences for the organization that cooperates with oversea universities, in order to raise the international advanced engineering education quality in China.

Keywords: engineering education, Sino-German cooperation, training mode.

1 Introduction to the Background

With the reform and opening policy in China, Shanghai built up the friendship with Hamburg last century. Thus University of Shanghai for Science and Technology (USST) started the academic communication with University of Hamburg for Applied Science and Technology (UHAST). The Sino-German cooperation engineering education was one of projects for the cultural exchange between Shanghai and Hamburg. The electrical engineering department (EED) of Shanghai-Hamburg College (SHC) started to enroll students in 1998. The object of this cooperation project is to take advantage of education resources from both universities, training students to become compound talents with good command of German language and engineering technology.

EED of SHC has been promoted by the labor market, economic demand, and regional development situation. There are lots of German Corporations in Yangtze

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River Delta Region. They prefer undergraduates who are good at German whilst well educated as an electrical engineer. It is estimated that the number of such undergraduates cannot meet the demand of the economic development in this area. They have been eagerly required by German-invested and joint ventures enterprises. So EED integrates the teaching resources from both universities and provides talents for the further development in Shanghai area.

Since the domestic undergraduate education put emphasis on theoretical teaching, then students can't adapt the requirements of enterprises quickly. The employers have to spend much time to help them to turn the knowledge into the ability. There is a big gap between theory and practice. It is investigated that Chinese students perform well in recite and memory, but poor in analyzing and solving engineering problems [3]. To improve this situation, EED of SHC have already explored and practiced on this respect for many years and got some achievements.

2 The Training Mode for Electrical Engineering Education

What is the target of the training mode? EED of SHC focuses on training the students to become persons who are fluently in German as well as professional in electrical engineering, with the international view to meet the needs of industrial modernization in China and what the German-invested corporation want. The students who graduate from EED have solid foundation on German, and a good command of theory and application courses. They can read the professional material fluently in German, and communicate with German on technical problems directly. The students can also pick up the capability of understanding and judgment for German language and culture, working well in different cultural atmosphere. [1]

The graduates can boast Chinese and German bachelor double degree if they have passed the total courses exam. All in all, we cultivate electrical engineers who can speak German. And the result shows what we are doing is just what the society needs for economic development.

2.1 The Characteristics of Professional Training Plan

The training plan of EED is designed based on "basic demand plus specialty". With a very clear positioning, the training plan takes the advantage of the experiences from German University as well as combining with the reality in China to realize the highlight of this Sino-German cooperation project. To meet the requirements of bachelor degree from both sides, the total credits is up to 249 and distributes from 1st to 8th semester as shown in table1. There are 4 points of teaching character in the training plan.

Table 1. Credit points distribution in 8 semesters

Course division	Credit points distribution per semester								sum	percent
	1	2	3	4	5	6	7	8		
General Course	4.5	0.9	0.9	4.9	0.0	4.9	0.4	0.0	16.5	6.6%
Major foundation Course	28.5	30.5	32.5	19.5	6.0	11.0	7.5	0.0	135.5	54.4%
Professional Course	0.0	0.0	0.0	5.0	24.0	16.0	17.0	25	87	36%
Optional Course	10								10	4%
Total	33.0	31.4	33.4	29.4	30.0	31.9	24.9	25	249	100.0%

German Teaching for the Object of Cultivation. First year, the plan has been put emphasis on German, starting from zero point. There are also a part of basic courses such as politics and mathematics. The total language teaching hours is 960. The language teachers come from both sides. Teachers from USST focus on the grammar and the writing, while the teachers from Germany focus on oral training and cultural introduction. After one year, 95% students can pass ZD test, which have a good step for the further study.

From 3rd to 6th semester, there are 80 hours for German comprehensive courses each term. Such courses do good to enhancing German ability, learning how to read scientific articles, and listening to German professors' technical course for students. In parallel, there are two technical courses taught by German professors from 3rd to 6th semester. The students are always studying under the bilingual education atmosphere.

Absorbing High Quality Teaching Recourse from Germany. In the plan, one third of language courses and one third technical courses are undertaken by German side. Most of the language teachers graduate from famous Humboldt University. All technical professors come from UHAST. All German teachers use textbook and speak lessons in German. USST has sent Chinese teachers to work at the lab in Hamburg to learn the experimental method. Thus there was a base which both sides teachers have constructed the lab at EED together. These labs are suitable to the training mode to make full usage of mutual teaching resource.

Strengthen Practice in Industrial Atmosphere. We aim at training the students to become electrical engineers who can speak German. So there is 18-weeks internship at 7th semester in the curriculum. We choose the corporations invested by German in manufacture fields. About 10% top students have been sent to local enterprises in Germany. During the period of internship, most of the students would find graduate design project in companies, and then they would work on the project in 8th semester. This is a typical training mode of Sino-German cooperation engineering education for applied talents.

Training the Communication Skill for Multi-culture. The undergraduates will boast excellent language, professional knowledge and operation ability. Besides,

they can understand multi-culture and have communication skill, which is especially required in Sino-German companies. Due to the students of EED exposed to the cross-cultural environment, they show better performance than normal class. We have got positive feedback from companies, "the undergraduates appear to be conscious of cooperation, team-working, and swift adoption the community. They understand and accept the different culture quickly, and try to communicate with people in an appropriate way to express their ideas.

2.2 The Exploration of Engineering Education on Practice

Experimental Teaching. In order to guarantee the quality for the experimental courses, the rule of the exam and study for double bachelor degree in SHC points out definitely that "after the students only pass the exam of the experiment, they can take part in the exam of corresponding theory courses" [1]. It means that the eligible score of the lab course is the necessary requirement of the exam for the theory courses. This shows one of the characteristics of SHC on the exam rule side.

The labs at EED have obviously characters, which many experimental devices are developed by the Chinese and German teachers together. When we configured the hardware, the facts must be considered, which of types most of German enterprises use the equipments. For example, PLC devices are selected within Siemens and Schneider family, and 3000W industrial motor power as controlled objects are installed rather than small power motors. Also some experimental platforms closed to the industrial environment have been built up, so that the students will shorten the adaptive phase when they start to work in the factory.

The most of German professors who teach the technical courses worked once in some famous enterprises, such as Siemens, Phillips, Airbus Company etc. more than 5 years. They had engineering experiences in electrical field. They are sure to instruct the students in the lab by themselves. On the other hand, the Chinese teachers who have engineering professional title are considered into the team preferentially.

The Graduation Design. Most of Graduation design projects come from the enterprises. Each student has three mentors, one is the Chinese from USST, second is the German from UHAST, and third is an engineer from the enterprise. Teachers focus on the professional knowledge, papers, and bachelor presentation. Engineers focus on the technology and guidance on the scene for the project.

The students have to propose the application before the graduation presentation, and the examination committee review and approve it. The students have to state their projects contents in Chinese and in German two languages. The presentation time is not less than 45 minutes. The test officer is composed of more than 4 teachers including one German professor at least. The graduation design is divided into two stages, first is the implementation and second is the presentation. Students' two kinds of ability have to be measured by two scores to reflect different aspects. Through the observation to the previous graduates, the method of assessing is reasonable.

The Object of Internship and Selection of the Enterprise. The rule of the exam and study for double bachelor degree of SHC point out the object of the internship. “By actual participation in the internship, the students can learn how engineers do work in the factory systematically. The students have opportunities to solve real problems with the knowledge they learnt in the university. On the other hand, the students will understand the running process of the enterprise from different view. They will recognize the relationship between the science, technology, organization, economics and sociality in the affairs of the enterprise.” [1]

The chosen enterprise can realize that the university and the enterprise jointly undertake the education task in order to cultivate qualified engineers. Most of the human resources departments have such knowledge at German enterprises. According to the training goal, the chosen enterprises can help students improving their German ability and getting training on electrical technology. These enterprises that meet the requirements locate mostly in Yangtze River Delta Region, and can provide the practice expenses and working conditions for internship.

The Guidance Duty and the Assessment for Internship. The Chinese teachers’ responsibility is to check the internship report in Chinese version every two weeks, to visit each enterprise regularly, and coordinating various problems. German professors’ duty is to check the internship report in German version via E-mail and submit the proposal on improving report.

At the end of internship, Chinese and German professors check summary report individually and give the scores. The students have to do the presentation about 20 minutes. The comprehensive score is composed of the report quality, the evaluation from enterprise and the presentation grades. Through 18 weeks internship, most of students have achieved remarkable progress. They can gradually consider and solve problems in an electrical engineer's way.

3 The Quality Assurance for Electrical Engineering Education

Germany is a well-known country that pays attention to the quality in the world, as well as being good at making a series of industrial standard. This point also manifests in the engineering education cooperation. Through exploration for many years, SHC has formed a set of completely quality assurance system in order to provide qualified electrical engineers. At first, the students must fully comply with graduation rules and regulations to obtain Chinese bachelor degree. Due to a third of courses taught by German teachers, UHAST control the human resource of teachers on German side.

In order to offer the German bachelor degree, the rule of SHC has been carried out strictly. There are some special clauses is stated as following. The qualification of the internship is that students must pass all courses exam from 1st to 6th term. The qualification of doing graduation design project in 8th semester is that students must pass the exam in all courses. There are only 3 times exam for each course. Don't allow the test again for performance enhancing after students pass the exam and so on [1]. These rules are very different from one for normal class.

These rules provide the guarantee of the engineering education quality for Sino-German cooperation.

Since EED of SHC established in 1998, we constantly absorb advanced education resources and achieved successful experiences. This project already passed the accreditation of ASIIN (German engineering discipline accreditation institutions) in Dec. 2004. It meant USST had become the first university that had the qualification to offer the Chinese and German engineering bachelor degree in Asia area. It was a milestone of the internationalization of advanced engineering education. Six years later, we passed the re-accreditation of ASIIN once again in July 2010 and extended this qualification next 8 years [2].

4 Conclusion

Education is a kind of investment for person, society and economy. Meanwhile, it is also of risk. It will not be considered as success if it couldn't meet the demand from the three aspects. The graduates from EED of SHC can speak German fluently and work professionally in electrical field. They are proficient in operation and well in communication. All these win compliment from the employers. Especially German-invested enterprises are willing to accept these graduates as new employees, who are offered with wages higher than the average level. The employment rate is always higher than the electrical normal class in USST. It has been proved the fact that cultivation of the compound applied talents meets just what economic development needs. The result turns out that the exploration of cultivating the electrical engineers who can speak German is successful and will stand up to the challenge from the labor market.

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The Applications of Web3D Technologies in Web Teaching of Engineering Graphics

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Abstract. Developing of teaching resources is the important and key components of Web teaching system of Engineering Graphics (EG). The multimedia resources of Web teaching on EG should be three dimensional (3D), interactive and suitable for the Web. These resources are different from that created by the technologies of dynamic Web page, Flash and stream media, etc. which have some disadvantages in constructing of real environment and interacting in real time. The development of Web3D technologies, main developing methods and process are presented in this paper. The application of Web3D technologies in designing and developing of Web teaching resources of EG is also studied. Some examples of the application of Web3D technologies, such as VRML, Java and Cult3D, are given in the paper.

Keywords: Engineering Graphics, Remote Education, Web3D Technology.

1 Introduction

Modern remote education is a new type of education. It is generated as the development of technologies of computer network and modern information. It plays an important role in modern education. It is based on computer network and has the interactive teaching form.

The main problem faced on Web teaching is how to provide rich multimedia teaching resources and effective studying environment. At present, the Web teaching mainly uses dynamic Web page, Flash and stream media to show the information of knowledge. But these resources have some problems in constructing real environment and interacting in real time. In Web teaching, Web3D technologies, which are based on computer network and 3D graphics, can overcome these problems. Web3D technology has shown its powerful superiority and great potentiality in Web teaching because it has the functions of vividly presenting, powerfully interacting and animating of the real world. This paper introduces the history and main technologies of Web3D. The applications of VRML, Java and Cul3D, etc. in designing and developing Web teaching resources of EG are also studied by some examples.

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2 Web3D Technologies

2.1 Web3D and Virtual Reality (VR)

Virtual Reality (VR) is an interface technology of animating the people's visual sense, hearing sense, touching sense, moving and etc. The technology of VR can be used to show the 3D world in real time, provide an interactive operating environment and give users the sense of real world. So, the studies and applications of VR have attracted the attentions of many researchers[1].

In the latest years, as the rapid development of Internet, many technologies of VR based on Internet have emerged. Web3D is an Internet and software based desktop technology of VR. It is an extension of 3D graphic technology of local computer to that of Internet. Its essential feature is Web performance, 3-dimensional and interactive. Web3D technology provides a Web method of presenting virtual reality.

2.2 Realizing and Developing of Web3D

The first Web3D technology is Virtual Reality Modeling Language (VRML), which was published in 1995. The VRML97 specification, which has been widely used nowadays, is improved in interacting, node controlling and etc. This version of VRML is more stable and easy to extend that promotes the Web3D technology. As the increase of requirements to the functions of Internet, the requirements to Web3D technologies are also increasing. So, in 1998 the VRML organization was renamed organization of Web3D and decided to release the X3D (eXtensible 3D) to unify the standards of Web3D. Then the organization of Web3D finished the transformation of VRML to X3D. X3D integrates the advanced technologies of XML, Java, stream media and etc. and provides more powerful and effective calculation capabilities, rendering quality and transform speed [2]. The developing technologies and tools of Web3D include VRML/X3D, Java3D, OpenHSF, MPEG4, Cult3D, Viewpoint, Sokewave3D, Blaxxun3D, Shout3D and etc[3].

Although there are many realization technologies and solution methods for Web3D, their basic construction and developing process are similar. To use VRML and Java requires good programming experiences. The procedure of using Cult3D is simple and as follows. Create 3D models in the 3D modeling applications (such as 3DSMAX, Maya and etc.) and export the 3D models in the suitable format for the designing software of Web3D. Load the 3D models into the designing software of Web3D, build 3D scene and add actions to the objects, then export this Web3D product for Web browser. Browse the Web3D product with the player plug-in and manipulate it freely in the virtual scene.

3 Research Works on Applications of Web3D Technologies in Web Teaching of EG

3.1 Knowledge Presenting and Studying Using Web3D Technologies

The virtual and interactive technologies can make the abstract concepts visual and vivid. They can also provide the active and lifelike materials for studying, which would take less time to understand these new concepts. And they are also helpful for students to overcome the difficulties in their study. For example, in teaching the concepts of intersection of geometrical bodies, the change pattern of the intersection of the bodies can be examined dynamically and interactively by using web3D technologies.

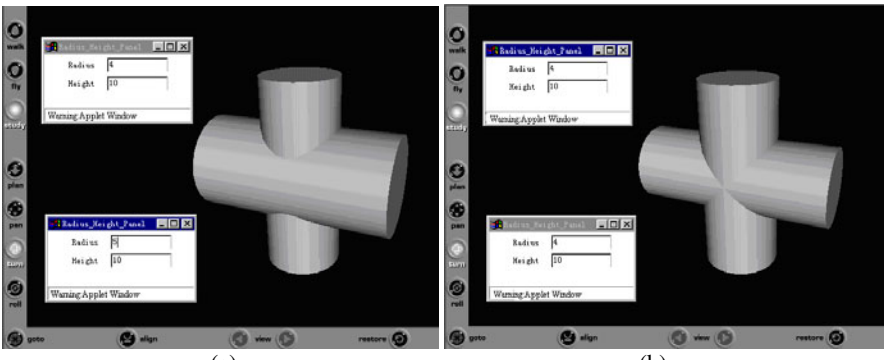
The following is an example of intersection of two cylinders. The change pattern of the intersection can be observed in real time by changing the value of the cylinders shown in the window through the VRML-Java technology. As the value changed, the size of the cylinders in the virtual scene is also changed dynamically.

Java is a multi-platform Web programming language. The virtual world created by Java and VRML is more lifelike, active, interactive and then more useful. It is possible that using Java can extend the functions of the descriptive language VRML[4]. The program of the example mainly consists of three parts:

Creating Virtual Scene. The virtual scene is created by VRML. The "script" node of VRML can define arbitrary behaviors, create or change 3D models through the fields and events of "eventIn" or "eventOut" by writing program in scripting language. The scripting language could be any one supported by VRML browser. Generally, it is Java or Javascript. The program written in Java should be compiled to generate "class file" which can be embedded in VRML file. In this example the file linked to the "url" field is the Java class file of the following mentioned control program.

Designing the Window of Input Parameters. The Abstract Windowing Toolkit (AWT) of Java can be used to set the data in the textbox of the window to control the size of the two cylinders. The components of the window, which can be used to design the Graphic User Interface (GUI), are included in the archive file of Java.awt.

Control Program. The control program is written in Java. It can get data from the textbox in the input window and dynamically control the shape and size of the cylinders in virtual scene through the "script" node of VRML. Fig. 1a is the Web page of two cylinders and AWT window of Java created with the method mentioned above. Fig. 1b simulates the change of intersection of the two cylinders caused by the change of their shape and size.



(a) (b)

Fig. 1. The change pattern of the intersection of two cylinders

3.2 Creating the Library of Web Virtual Teaching Models Using Technologies of Web3D

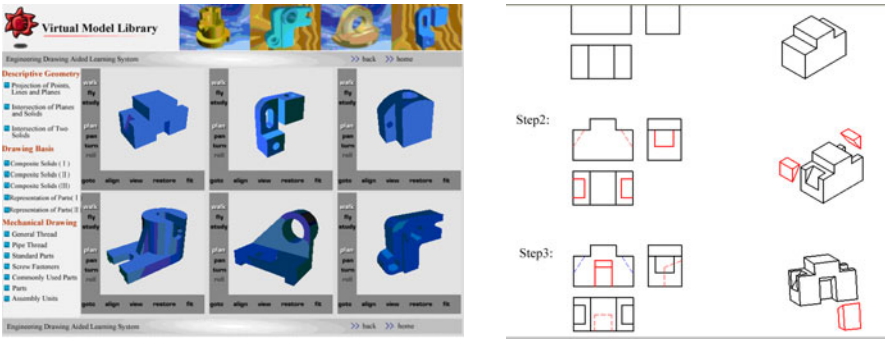
In Web teaching of EG, electronic model can present the geometric relations of objects actively and make students understand the 3D geometric concepts more deeply. It is the most important and effective media in Web teaching of EG. The static and dynamic Web pages and 3D animation added in the pages with extended technologies generally play linearly. The scene displaying in these pages can only be watched. It is difficult for the user to interact with the scene. But the Web virtual models created with Web3D technologies are based on VRML and can be interacted. So these models can help students get learning experiences in the virtual world and enhance their understanding and remembrance.

VRML defines a standard file format to describe 3D objects and interactive 3D world on Web. The VRML2.0 specification defines 54 different node types to describe 3D objects and world[5]. Fig. 2a is a Web page stored in the model library for Web virtual teaching. The 3D models of objects shown in the page are created using the method mentioned above and the interactive actions of combining and separating are realized through VRML programming. The realizing method is as follows:

In the teaching of EG, we think that the objects shown in Fig. 2a are combined with some basic objects (primitives), which is helpful for students to understand the complex objects. The space positions and actions of the primitives of the objects can be described by using “TouchSensor” node to control “Timesensor” node and to drive “PositionInterpolator” node or “OrientationInterpolator” node. When clicking mouse button on the Web page, through the acting of the “Rote” and activating the input and export fields of the nodes, the interactive animation of combining and separating of the primitives is realized.

The user can interactively manipulate the 3D model and watch the drafting procedure of the views of the object by setting the value of “url” field in “Anchor” node to link to the Web page in which the drafting procedure of three orthogonal views of the object displays (Fig. 2b). It is useful for students to enhance their

visual thinking of transforming from 3D object to 2 dimensional (2D) drawing or, on the contrary, from 2D drawing to 3D object.



(a) (b)

Fig. 2. The virtual model library for teaching

3.3 Using Web3D Technology to Make Virtual Experiments for Assembling and Disassembling of Mechanical Assembly

Many types of virtual experiments can be made using Web3D technologies. Students can do these experiments repeatedly and interactively in the virtual environment to understand the assembling relations of the parts in the assembly.

In the constructing of Web teaching platform for measuring and drawing of mechanical assembly, we have designed a Web virtual experiment of assembling and disassembling of the assembly using Cult3D technology. On this platform, students can do the experiment of assembling and disassembling repeatedly, animate the real operating conditions and study the internal and external structure of the assembly. Following us take the gear oil pump as an example:

Cult3D and its Developing Procedure. Cult3D is a new technology published by Cycore Co. of Sweden. It is a software-only, multi-platform 3D object-rendering engine. Cult3D allows fully animated 3D scenes, ranging from simple sequences of motions all the way to complete interactive 3D presentations, without any special hardware support. With built-in compression and streaming capabilities, Cult3D file format is small and efficient, resulting in faster downloads and progressive viewing. Cult3D supports many types of motions and interactive controls, including translation, rotation, scale and response to the input events from keyboard or mouse[6].

Cult3D can not create any 3D models. It controls the motions of the 3D objects by the Cult3D Designer. The developing procedure of Cult3D applications is as follows: Firstly, create the 3D model of the gear oil pump using 3D modeling software (such as Pro/E, MDT, Solidworks, etc.). Secondly, input the 3D model into the software 3DSMAX and export it into a Cult3D Designer file (*.c3d) using

the Cult3D Exporter plug-in. Lastly, edit the object in the Cult3D Designer by adding events and actions.

Dynamic Presenting of Operation and Virtual Assembling of the Gear Oil Pump. The main working area of the Cult3D Designer consists of many different sub windows. The Event Map is the main sub window to drive the interactive actions. On the left side of the sub window, there are some event icons, such as "Mouse Button Pressed" and "Keyboard Button Pressed or Released", which can be dragged into the Event Map sub window to link to the actions from the Action sub window. The parameters of the events and actions can be set to control the complex interactive actions of the events. Cult3D Designer saves the presentation as a Cult3D project file (*.c3p) and writes a compressed binary file with extension *.co that can be embedded into the Web page.

Fig. 3 is a dynamic Web page that presents the working principle of the gear oil pump. The user can study the working principle dynamically, interactively and in real time. Fig. 4 is a Web page that presents the disassembling of the pump. The user can study the shape of the pump from different viewpoints and the procedure of virtual assembling and disassembling by pressing the mouse button according to the text prompts on the page.

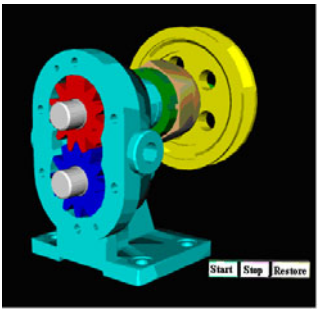


Fig. 3. Dynamic presenting of working principle

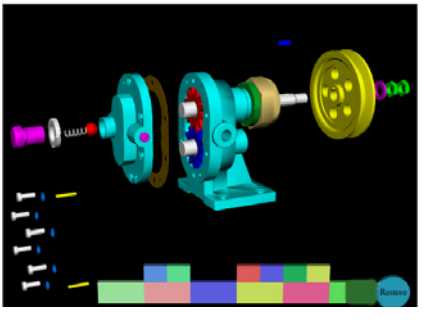


Fig. 4. Virtual assembling

4 Conclusions

As a new technology of Web 3D graphics, Web3D technology has the distinctive advantages in presenting of 3D models, creating of virtual world and interacting in real time. Applying Web3D technologies in EG can provide VR studying resources and scene experiences that have no limitations in time and location. It can be predicted that web3D technologies will progress continuously and play a more important role in the Web education.

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Keystone of Engineering Education — Ethics Education

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Abstract. Engineers, in the modern society, are shouldering more and more important ethics responsibilities. They are to some extent responsible for the damage of the environment, the quality and safety of constructions, the destruction of cultural heritage and the risks of accidents. Ethics education is essential for engineering education. Engineering Ethics education help students deeply understand the social responsibilities they will shoulder in their work. Engineers must highly respect the life value of human beings, deal with the relationship between human beings and nature properly to achieve the transformation from industrial civilization to ecological civilization and the sustainable development of ecologic building. The paper intends to analyze the necessity for ethics education of engineering and discuss the approach of engineering ethics education.

Keywords: Engineering Education, Ethics Education, Environment, Quality and Safety of Constructions.

1 Introduction

Engineers, in the modern society, are shouldering more and more important ethics responsibilities. They are to some extent responsible for the damage of the environment, the quality and safety of constructions, the destruction of cultural heritage and the risks of accidents. "As the main subject of the design, organization, implementation, management of the engineering activities, what responsibility should engineers and technicians assumed for the quality and effect of the engineering activities, what is the impact on social and environmental play by their activities become the focus of increasing concern." [1] Ethics teaching is essential for engineering education.

2 Necessity of Ethics Education of Engineering

2.1 Engineering and Environment

The relationship between engineering and ecological environment is a kind of relation of ethnics as well as a kind of relation of production. The Ecological

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environment provides engineering activities with raw materials and space, and engineering activities constitute the complicated social relationships between environment and human beings. Engineering activities produce pollution to the environment while turning the scientific and technological achievements into productive force, which brings unimaginable negative effects to the ecological environment.

With the development of industry, there is a tremendous increase in fuel consumption. Huge quantities of waste gas are discharged. The concentration of carbon dioxide in the atmosphere is increasing steadily. Carbon dioxide tends to block the radiation of heat from the earth in the form of infrared radiation, which has increased global mean temperature. The Arctic Ice is melting; storms and floods are becoming more and more destructive; Heat waves are causing more deaths; drought is becoming more severe and the extent of desertified land is increasing. The melting glaciers lead to sea-level rises and in the course of the next hundred years, if the sea level continues to rise in such a great or greater rate, the costal low-lying areas will disappear beneath the waves. What's more, much of the most productive farming areas will be drowned. The ecological environment that human beings depend on is seriously threatened.

A great lot of wastewater is discharged by kinds of industries, such as paper and pulp industry, dyestuff industry, medical industry, electroplate industry, pesticide industry and petroleum refining industry, etc. Toxic matters are contained in industrial wastewater. People's health will be threatened if they drink the contaminated water or have the food contaminated by the polluted water. For example, the pollution of mercury happened at Minamata Bay, Kumamoto town, Japan in 1953, which is a heavy metal pollution event in our history. In 2007, more than 70000 people are involved in the water-drinking endemic fluorosis Fluorosis in GuYuan city of NingXia Province. Thus "whether the engineering innovation is appropriate or not concerns not only the process and quality of the project itself, also the impact on society and natural systems in the construction and operation process and even to the future of human". [2]

2.2 Engineering and Risks

Accidents, resulted from technological uncertainty, happened frequently. Rational value is lost. A moral and ethical problem exists in the development of technologies. The application of new technologies in the environment of market economy, such as the high speed train, the nuclear power, can bring commercial benefits. However, some safety problems also come out. For example, the high speed train ICE 884 accident happened on June 3, 1998 in Eschede which was generated by a fracture of the wheel rim. High speed accidents most probably lead to disastrous consequences. Not only are tremendous losses caused in the lives and properties of the people, but also a bad influence on society. Risks also exist in the Nuclear Power Plant which uses sustained nuclear fission to generate heat. The Accident at the Chernobyl Nuclear Power Plant occurred on 26th April 1986 in Ukraine. In the process of a test, the operators turned off several of the safety systems, which turned out to be disastrous. It is estimated that the radiation from the Chernobyl

disaster was 100 times more powerful than the bombs dropped on Hiroshima and Nagasaki. Thirty-one people died shortly after the nuclear explosion, but thousands more suffered from long-term effects of radiation.

2.3 Engineering and Historical and Cultural Heritage

Engineering activities are of great importance for human civilization and future generations. Some engineering activities make profits at the cost of historical and cultural heritages so that our future generations might no longer see them. The loss is what we can't afford. For example, Dampier island, which was the topic of volcanic mountain about 30,000 years ago, possesses 500,000 to 1,000,000 petroglyphs, constituting one of the greatest collections of rock art in the world. However since significant reserves of natural gas, petroleum and iron ore resources are found here in 1960s, the petroglyphs have been damaged seriously by the industry. The rock art has been etched away by the acid rain and sites, such as shell pile, have been damaged by road, pipelines. The future of the magnificent petroglyphs is shadowed by the damage of the industry.

2.4 Ethics and Safety

The special position of the engineer in the modern society determines that the engineer must take more moral responsibilities. The engineer might make jerry designs on the employer's request, which brings potential security risks; the engineer might release the designs which fall short of specification on the trustee's request; the engineer might release the constructions which don't meet the specification because of lacking in responsibilities. The engineer might only take the economic factor as the measure disregarding safety, which leads to frequent occurrence of accidents. Therefore, engineers are not only required to possess professional technological abilities, but also abilities to make moral choices while facing conflicting interests.

3 Approach of Ethics Education of Engineering — Initiate Engineering Ethics Course

3.1 Purposes of Engineering Ethics Teaching

Engineering ethics course is initiated to achieve the following purposes:

(1) Promote students' understanding of canons of Ethics for Engineers;
(2) Promote students' understanding of the engineers' ethics responsibilities;
(3) Improve students' sensibilities of ethics;
(4) Improve students' ethics judgment.

3.2 Main Contents of Engineering Ethics Teaching

The engineering ethics teaching centers around canons of ethics. By ethics teaching, the engineering students are required to reach the fundamental canons of ethics. The

fundamental canons of ethics for engineers put forward by National Society Professional Engineers are given as follows: [3]

(1) Hold paramount the safety, health, and welfare of the public;
(2) Perform services only in areas of their competence;
(3) Issue public statements only in an objective and truthful manner;
(4) Act for each employer or client as faithful agents or trustees;
(5) Avoid deceptive acts;
(6) Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

The engineering ethics teaching can be divided into several topics, such as principles of professional conduct for engineering, social responsibilities of engineers and environmental ethics.

By learning principles of professional conduct for engineering, students can know the definite standards that should be followed in their future work. In their work, engineers should deal well with the relationship between economic benefits and ethic principles. They should set the public interest as the precondition, justly distribute the interests among engineers, employers and clients. They shouldn't accept a bribe and make jerky-built constructions to ensure quality and safety.

Engineers not only are loyal to employers or clients, but responsible for the society and long-term interests of human beings. Engineers should accurately explain the consequences that the new-built constructions or new technologies might bring. Engineers should make out effective plans for accident prevention and treatment on the principle of objectivity and honesty. Engineers should issue responsible objections to the engineering constructions they reject as false. Engineers should be responsible for the society, for the ecological environment, for the precious historical and cultural heritage.

Environmental ethics is not only the requirement of ethics itself, but the necessary guarantee for the sustainable development of ecologic building. It is the basic principles of environmental ethics that the long-term interests of ecology come before everything else. The sustainable development of ecologic building requires the engineers should be devoted to "Clean Technology" building up the social responsibilities. What's more, the engineers should foresee the consequences of each segment in industry on environment, establishing long-term interests and responsibilities. Director-general of Chinese Mechanical Engineering Society Lu Yongxiang expressed that engineers not only require techniques and skills but also humanity and ethics. Engineers should take the social responsibilities to promote sustainable development between human and nature.

3.3 Method of Engineering Ethics Teaching

Case analysis is the teaching method which is suitable for engineering ethics education. The teaching combined with typical cases, especially negative cases, not only attracts students' attention, but takes a toll on them. For example, all graduates from the Engineering Institute of Canada wear an iron ring. The steel that is used for the ring come from a bride which collapsed soon after it was put to use.

The designer of the bridge graduated form the university. Because of the accident, Alma Mater was subjected to humiliation. Alma Mater bought the bridge steel and made rings as a symbol and reminder of the ethics and obligations associated with the profession. For years, many outstanding engineers still wear the iron ring. The engineering ethics courses in many universities abroad take the negative cases as the best teaching materials so that the students can take warnings from it. In class, while discussing the cases with students, teachers should encourage students to perceive the ethics problems and make effective and correct decisions. By case teaching, students can better grasp engineering ethics principles, understand the social responsibilities and gain experience in dealing with practical problems.

4 Conclusion

Engineering Ethics education help students deeply understand the social responsibilities they will shoulder in their work. Engineers can make people live a happier life with their technologies and skills. However, if their acts are contrary to the engineering ethics principles, negative consequences will be caused. People's safety might be threatened, and ecological environment human beings depend on for living might be damaged, which casts a gloom over the long-term development of human beings. Engineers must highly respect the life value of human beings, deal with the relationship between human beings and nature properly to achieve the transformation from industrial civilization to ecological civilization and the sustainable development of ecologic building. "The starting point of engineering ethics education is to explore the responsibilities that engineers and technicians should for the employers, the society, the public and the future. The core problem is how to make correct judgments and choices while conflicts occur between the interests and responsibilities, between partial interests and general interests, between economical interests and environmental interests, between actual demand and long-term aim" [4] So far, there is nearly no ethics teaching in college engineering education. Engineering ethics education hasn't got enough attention and concern at home. "Engineering ethics education is an important part of ideological and political work, but it is also a part that is easily neglected" [5] Therefore, it's necessary and urgent to add ethics teaching to engineering education.

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Problems and Countermeasures of "Village to Neighborhood" by the Process of Accelerating Urbanization

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Abstract. The essence of "Village to Neighborhood" is a kind of social interests redistribution, its value goal is to pursue development and progress and improve people's quality of life. It is to break the political and economic structure of urban-rural, urban and rural areas to promote the integration of direction toward an important measure.This article to safeguard farmers'--- prospective citizens' basic rights as a starting point, from three aspects of civil rights, people's livelihood and local reality analysis about basic rights of farmers--- prospective citizens. And put forward some suggestions based on civil rights maintenance, civil livelihood security and civil local reality conformance.

Keywords: "Village to Neighborhood", Prospective citizens, Urbanization.

1 The Definition and Essence of "Village to Neighborhood"

Our country is in the accelerating urbanization stage, all over the country has become a "Village to Neighborhood" phenomenon. The so-called "Village to Neighborhood" in the city, simply said, is the edge "village inside city" gradually be delimited the urban management scope, which named "Village to Neighborhood".It is the urban-rural dual structure of rural urbanization in the background of the new path, which is the top-down driven, with the existing institutional framework and policies of all forces under a joint participation of the local social transformation, social reform. Although they have become policy meaning of citizens, actually quite a lot of them couldn't be called the true meaning of citizens. How to adjust interest relations and how to optimize social structures to enhance the social status of prospective citizens and to promote prospective citizens become true citizens, which have relation to whether "Village to Neighborhood" work smoothly and value goal realize fully.

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2 The Main Problems in the Process of the "Village to Neighborhood"

The differences of every reality of village result in the non-universal of "Village to Neighborhood". Because of the lure of land interests, local government performance and the pursuit of economic interests, and farmers lack the right to speak, if farmers—prospective citizens can't get enough attention and security, the blind and reckless "Village to Neighborhood" will certainly affect the process of urbanization and even social stability in China. "Village to Neighborhood" in the following basic rights for prospective citizens need high attention and fully guaranteed.

2.1 The Aspect of Civil Rights

Firstly, the land expropriation compensation quantification and convert problem. The government itself in the way of land acquisition compensation terms of conversion lack of interaction with prospective citizens and the lack of participatory mechanisms widespread. Moreover, in order to have room to live, with the land of low compensation and whose inability to land under development, prospective citizens would give the land use value and value-added potential to the developers for frustration.

Secondly, whether "Village to Neighborhood" after the change of staff and management has been reflected civil rights. "Village to Neighborhood"", the neighborhood generated by members of the municipal district-level government or an agency of the government assigned, appointed or recruited from the society. While this way ensure the greater extent the quality of management, there is no doubt these "outsiders" would have been more or less intentionally or unintentionally exclusion or detachment with the local.

2.2 The Aspect of the Livelihood of People

Firstly, the living and employment questions of prospective citizens. Objective point of view, most of the worrying situation of prospective citizens are related to their low quality. They have old concept of employment and weak sense of market competition. To a large extent there are the "wait for, rely on, ask for" thought. A part of prospective citizens land shall rely on the welfare dividends, rent house income for living. They doing nothing all day and become to idle staff.

Secondly, the psychological adjustment problems of prospective citizens. First , after the "Village to Neighborhood", the villagers in the community actually has a dual identity: both city people and rural people, the changing of the identity needs a process of psychological adaptation. Second, after "Village to Neighborhood", although the villagers have the city accounts, but many parts of the standards of their poverty relief in rural areas are still not the same as members of the public in parts of the minimum living standard. Third, the self-government implementation of the residents will make prospective citizens lost the directly vote right.

2.3 The Aspect of the Local Reality

First of all, "Village to Neighborhood" is neither universal nor unconditional. It must be adapted to local conditions, and the time to carry out. And to break the differences between the rural and urban areas in economic, social, and cultural ,realize to rural political organization, forms of economic organization and land ownership conflict-free change to prospective citizens into urban residents smoothly to ensure these disadvantaged prospective citizens benefit from that as a target.

Second, China has a vast land, every regions show different characteristics of the natural geography and climate. Some areas only suitable for farming, or in the way of farming than any other economic show obvious advantages in comparison. And the villagers in this kind of economic structure, forms of labor, climate and geographical conditions could live and work in peace and interest. In this case, the function of reform will not be very obvious, and even lead to counter-productive.

3 The Problem Solving Ideas in the Process of "Village to Neighborhood"

The essence of "Village to Neighborhood" is to let more and more farmers leave the earth, "transformation" into the city.However what happened, no way to make prospective citizens' political and economic interests and rights damage, this should be a bottom line, beyond this bottom line, the urbanization is a failure [1]. Therefore, the "Village to Neighborhood" should be in the principle of maintenance the rights of prospective citizens, protect the livelihood of prospective citizens and follow the reality of prospective citizens to conduct.

3.1 Maintenance of Civil Rights

First of all, in part of grassroots organizations, focus on to ensure the voice of prospective citizens. Under the "village law", "community law" and some other relevant laws to establish a link with the primary function of social self-government laws and regulations, coordinating the transition to the residents in the village appears in the contradictory relationship between the subject and application of conflict of laws. The number of cadres in the restructuring of the former case guaranteed, may be appropriate to recruit professional and managerial talents from the society in order to add vitality to the community.

What's more, in part of the collective land treatment, we must strive to maintain prospective citizens land rights. Before the implementation of urban development, the original village collective economic organizations and their members continue to use. After the land was requisitioned by the government, the government should refer to state construction standards to compensate. Specific compensation methods should be "bottom-up" to collect wisdom, so that prospective citizens could participate in brainstorming, and then discussed and decided by a higher level of the original village. When the land development, the government should apply for

more real estate for prospective citizens, after the "Village to Neighborhood", they can rent for life and pension.

Last but not least, in part of the treatment of collective assets, the government should maintain the production capacity of local areas. An appropriate increase in land compensation standard, not only for prospective citizens to achieve a relatively reasonable protection of life, but also conducive to they establish up their own business. Those can not be strictly separated from the collective assets to prospective citizens, the government could gather the confluence who have the economic credibility and responsibility of prospective citizens to set up township enterprises or invest in other enterprises in order to promote the establishment of village economy stock.

3.2 Safeguard People's Livelihood

Firstly, in part of the social security, the power and responsibility of prospective citizens should be consistent and in line with the original citizens. Prospective citizens in employment, schooling, medical care, and many other aspects of urban residents should enjoy the same treatment, while fulfilling the obligation of the citizens. After prospective citizens access to land transactions in the main body of the real position and the corresponding gain access to land transactions, the government can not taking on too much social security, but that does not mean that it can provide social security for prospective citizens.

Secondly, the whole society should work together to promote the employment capability of prospective citizens.

From the government point of view ,the government should take positive guidance, and actively promote, both rural and urban ways to increase policy support for rural labor force as soon as possible a series of policy measures to vigorously promote the development of township enterprises.

From a social point of view, social organizations under the financial support could in the creation of employment skills and career skills on the job training courses for prospective citizens to provide certain educational and vocational training opportunities to ensure the regeneration capacity of them. Meanwhile, banks should set policy to guide prospective residents credit the "green channel", as the economic support of their own businesses maximum.

Speaking from prospective citizens, prospective citizens' employment concept need to improve, accelerate to form market competitive sense. They should strive to improve their own quality, and constantly enhance the ability to adapt to society and the skills to integrate into society fast.

Thirdly, the government should fully decentralized, through policy support to prospective citizens living a new life. If prospective citizens didn't have rights to determine those key problems related to themselves, and the government is lack of necessary supervision in the process, the phenomenon of going against to social justice and damaging prospective citizens would be inevitable. Thus, in the "Village to Neighborhood", the government should actively encourage prospective citizens to participate, so that government affairs, appropriate delegation of authority, and to avoid "all government" appears.

3.3 Responsive to the Public

First, before the reform rationalize the "Village to Neighborhood" object selection standard. Such as whether the local population has reached a certain number of villages, whether the local economy has reached a certain level, whether the local production capacity has reached a certain height are on one hand, on the other hand, whether local natural climatic and geographical conditions were suitable for the reform of the city.

Second, among the reform process, the government should fully consider public opinion. If ignoring the wishes and aspirations of prospective citizens, the government impose "Village to Neighborhood" completely, social problems and strong dissatisfaction could be caused easily and prospective citizens even to take extreme measures to create disturbances probably. To avoid such problems, we should fully respect the wishes and choices of prospective citizens so that they have a certain right to choose and decide, through legal, institutionalized procedures to promote "Village to Neighborhood" in order to promote it orderly and smoothly.

Third, after the reform, the government should establish a new modern community. The government should support the "Village to Neighborhood" areas to built public facilities, infrastructure, and other facilities, and establish preferential policies, implement special funds to the community after the reform of urban integrated into the urban infrastructure management. Such as the establishment of counseling agencies to adjust the psychological adaptation questions which is faced by prospective citizens after the "Village to Neighborhood". And through cultural and sports activities and competitions, fitness equipments to enrich the cultural life of prospective citizens and so on.

4 Conclusion

"Village to Neighborhood" as a new era of rural urbanization in China's modernization is an important exploration of our party and the government to solve the "three rural" issue. And it is an important measure. But the emergence of a variety of some incidental or consequential problems are inevitable. At this time, you need to in the "interests of the overwhelming majority of farmers as the starting point "of principle, according to local conditions, according to the time, development of supporting the program, and established a supervision mechanism reasonable mechanism to attract maximum participation of local villagers, to promote urbanization better.

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The Research of Theory Education and Practice in University Career Planning

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Abstract. There are several weak points exist in the current career planning of undergraduate, such as poor ability, lagging education, incomplete guide system and so on. The ways to improve undergraduates career planning are: to improve their career planning capacity and to establish a correct concept of career and vocational ideals; to enhance career planning and education to ensure that their career planning in the core position; to improve the social guidance system for a better education and service system of career planning programs.

Keywords: college students, career planning and education, practice.

1 Introduction

With the expanded college enrollment, higher education gradually ranges from the "elite education" to "popular education" which is the stage graduates have stepped in. Ministry of Education estimated that the graduates from regular institutions of higher learning have reached 6.7 million in 2011, an increase of 400 thousand college students compared with 2010, and that unemployed college students in 2010 is about 1 million. Providing survey results show that the graduates are finding jobs without clear aims and direction, or even don't understand their own personal specialties, preferences and what industry or which company they shall apply to. Otherwise, blind vocational choices that they make put the emphasis on the place of employment or treatment[1]. The phenomenon of "employment difficulty" and "recruitment difficulty" is coexistence. Facing gradually severe employment situation, the central economic work meeting raise a need to implement a more active employment policy to promote employment growth in all directions, so as to ensure that the employment situation is basically stable. It has drawn general society concern about the issues of difficulty graduates employment. Under the fierce competitive pressures, a common topic, that how graduates find a suitable job and realize the value of life, already occurs to us. College plays a very important role in college students' employment; therefore, it must assume responsibility of the students career planning and education.

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2 The Development of Occupational Planning in China

Vocational guidance and career education theory has originated in the United States. Since the early 20th century, it has gone through the directive counseling, non-directive counseling and career guidance of the development process, and has emerged factor theory, the pro- level of theory, psychodynamic theory, typology theory, theory of career decision, career aspirations theory, social learning theory, cognitive development theory, theory of life, and the corresponding method of career counseling. China's education sector and the academia actively learn from this series of career development theory, combined with our actual situation of university and college students, and generally agreed that the content of college students career planning includes five areas: self-exploration, self-awareness and self-analysis, a clear understanding of their personality, interests, professional values, abilities, etc; external environment analysis, the surrounding environment and the small environmental awareness, understanding of their environment and social organization in which the environment and environmental trends in the development and changes; goal setting, with their own conditions and environmental conditions for different time periods (short, medium or long term) and different content (work, school, life, income, etc.) of the development goals; developing targets and an implementation strategy; feedback assessment and correction, according to timely adjustments to changes in various factors, revised objectives and implementation. To do career planning well has a very important role: first, to benefit students making a clear aim in life and a rational planning of university life. Second, it helps students do the self-positioning, to achieve their full development. Third, it helps them improve the overall quality of students and enhance their social competitiveness. Fourth, it is helpful to universities to achieve educational goals, to improve the education system. Fifth, it's conducive to solve the social employment problems, promote harmonious society. Student College career planning is not only a fundamental and long-term issue to solve the employment problem, but a major issue facing higher education.

3 The Current Career Planning Problems

3.1 Infirm Ability of Occupational Career Plan of College Students

People's awareness of career planning is relatively late and lack of emphasis and students' awareness of career planning is much weaker as career planning came from Europe in the 1990s into China. The surveys find that many university graduates don't really understand the meaning of the content, importance process of career planning, and lack of career planning skills and methods. Most students making judgments in career decision are often based on the realities and perceptions of the community but lack of the correct positioning of themselves and long-term goal of rational planning, their choices of career values with a lot of blindness either. In addition, by the impact of higher education enrollment in

China, the increasing number of students leads to a direct consequence that the number of students conflicts with the educational resources, and that result in students practice education being out of touch with society[2]. The weakness of social practice makes these students lacking the external occupational characteristics and understanding of the professional environment, and results in pointless objectives and lower ability of occupational planning.

3.2 Career Planning Education Lag

Despite some achievements, career planning education of college students has lagged into the system of higher education in China and there are still many problems. First, the lag of correlation career planning theory, that is, some of foreign theories, such as stage of career development theory, career anchor theory, occupational matching theory and etc are difficult to digest. The corresponding courses are lagged behind, and professional career planning set are lack of pertinence and basic theoretical support. Second, career planning guidance is inadequate. Currently, most universities is only in oral and written on career planning, and practical guidance is seriously lagging behind, including college graduates employment guidance center not function fully. Third, career planning team is too simplification and aging. Professional skills of teachers in career guidance are not strong, or lack of theory and accreditation, so students can not have targeted guidance. Finally, career assessment is insufficient. Currently, evaluation tools and methodologies of college mostly imported from abroad, and not really combine with own localization, thus have a certain blind evaluation and seriously inadequate assessment of reliability.

3.3 Incomplete Career Planning Guide System

Career planning services in China is still an emerging industry. With the growth demand of career planning market, professional career planners who are for personal career planning follow in China. However, due to the industry in China started late, related systems and institutions are not perfect, and professional planners and related consulting services are very short, and career planning advisory body of social acceptance is still low. As the career planning awareness of students in China is weak and social guidance system is not perfect, few students choose related professional organizations and career counseling staff when they confused.

4 Implementation of the Career Planning Education

4.1 Change the Concept of Career Guidance and Ideas

With the conversion and the increasingly serious employment situation, career planning has been concerned more and more by society. The previous Career guidance is limited to college graduates in general and procedural guidance which has been increasingly unable to meet the requirements of the situation. In recent

years, the content and mode of career guidance in our colleges and universities has already broken this category, which is drawing on the successful experience of foreign countries and based on new ideas, put forward the guiding ideology[3]. The general trend is from simple people - job matching theory to career development theory, which is from the "school career" to "the development of life". During the specific practice, researchers and educators put forward the ideas, such as "full employment guidance" "education, career planning stages," "the establishment of comprehensive career guidance system" and "personalized Career Guidance Model". These ideas make a great impetus to the process of university employment guidance and fit the concept of quality education, and will also play an important role in improving the current employment situation of university graduates. Construct Chinese characteristics, and actively explore the employment guidance and career education system based on theoretical research of career guidance and career education. The education can be divided into four parts: exploration, location, practice, differentiation, and discusses the specific educational content in the four different stages in detail. Innovate a whole system of employment education and present a comprehensive improvement for university education, innovation and Graduate Employment Education System.

4.2 Build a New Career Guidance Model

Put forward the proposed definition of career guidance, content, ways and means, stage arrangements, and basic conditions during the whole career guidance model; construct a full new employment guidance model with certain significance. Career Guidance Model Network stresses the need to take full advantage of network to provide students with a variety of career guidance and services. The rational allocation of college graduates of these valuable human resources to stimulate employers to attract talent, and treasure the enthusiasm of personnel, and enhance students' sense of competition innovation awareness and capacity to adapt to society. Pattern of individual career guidance and employment improve the quality of the employment rate of university students as the goal, so that students from middle school students to successful completion of college students, people from college students to career change[4]. The guidance model focuses on the personality development of students; students stressed the need to follow the laws of physical and mental development of students to focus on individual instruction and guidance.

4.3 Construct Career Guidance and Career Education Curriculum

At present, many universities have adopted curriculum, counseling activities and other measures designed to make students career achieve some results. For example, Job Centre of Tsinghua University since 1993 officially opened the "career guidance" elective, in 2003, renamed the "Career Planning." The course is designed to help students to explore their interests, personality, abilities and values, to explore the world of career, to explore the social environment including policy, economics and other factors, learn career decision-making steps necessary to

master job search skills. Colleges and universities should, pay attention to the accumulation of experience in practice, combined with the characteristics of their schools and students, teaching careers teaching writing. Schools at different levels have different forms of career guidance activities "and to" provide students with training in different themes, nurture and enhance the ability of students in all aspects, including interpersonal skills, communication skills, organizational skills and leadership and so. "[5]

4.4 Employment Guidance and Career Education, Ways and Means

Now, college career guidance and career education for the main contents include: the general theory of career planning, the overall quality of development training, employability and skills training, employment policy and the situation is introduced, employment information publishing; for the content of the main forms used are: elective or required courses, training camps, seminars, fairs, forums, web publishing. In practice, many scholars on the basis of career guidance and career education conducted in depth. For example, Lou Yan Gong, Zhao Qiquan detailed description of the steps in career planning, content, career planning guidance in the forms, methods, and students discussed the effectiveness of career planning guidance. Around, also said: "The goal is a career counseling group counseling in the form and guide the students awareness of self, understanding of professional world, learning to master the methods and means of career planning, career development path initially set for the future lay professional self-realization foundation. "and made specific mode of operation and implementation.

Career Planning is a long-term project, students from the school at the beginning of the students started training and guidance. Colleges and universities should change employment guidance mode, the career planning as the core of employment and innovation, universities set advantage of educational resources, teachers and students with greater intensity, and continuously explore and strive to enhance the employability of students and the employment rate, to achieve their future life value of the benefit of the community to provide strong support.

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The Discussed of the Role of Mathematics Modeling in the University Mathematics Education

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Abstract. In this paper, it is elaborated the role of mathematics modeling in the education for all-around development, and in raises student's mathematics ability as well as in the innovation ability. It is discussed that how to play its important role of mathematics modeling in the university mathematics teaching.

Keywords: Mathematics modeling, education for all-around development, innovation ability

1 Mathematics Modeling Function in Education for All-Around Development

Mathematics education is essentially one kind of education for all-around development, the university mathematics teaching reform must vigorously promoting mathematical teaching more consciously implement the spirit of education quality. The university mathematics curriculum teaching's education for all-around development needs to take seriously to raise university student's innovative spirit, innovation ability and the practical ability, causes the student not only to grasp mathematics concept, the method and the conclusion, moreover must make the student to comprehend mathematics profoundly the spiritual essence and the thinking method, comprehends mathematics discipline the essence, causes mathematics method, mathematics thought to become their handy tool. This should be the goal which the university mathematics education pursues diligently, simultaneously is also the result weighs of the university mathematics teaching.

The so-called education for all-around development, is that teachers of students through the implementation of knowledge carriers psychological and intelligent guidance. The university mathematics education for all-around development's goal is causes the student under teacher's guidance, through the appropriate carrier, on own initiative studies and enhances itself to choose, the absorption and the reorganization knowledge and information ability unceasingly, raises mathematics quality, raises student's creation ability and innovation ability, synthesis induction

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ability, deductive reasoning ability, mathematics utilization ability and so on. Must manifest the request of the education for all-around development fully, mathematics teaching cannot separate with other disciplines, cannot isolate with the entire outside world, cannot center on the mathematics internal concept, the method and the theory merely carries on the teaching. We must combine mathematics teaching and student's study organically with ever changing, differ in thousands of ways, the spirited real life, lets the student embark from the actual problem, through abstract and the supposition establishes the mathematical model.

Mathematics modeling activity as well as the mathematical model and mathematics experiment curriculum's start is a successful attempt in university mathematics educational reform. Over the years, the university mathematics' teaching often becomes the own system, is at the self-closed state, not to be ideal regarding for other curriculum that needs the applied mathematics knowledge. After the student studies much mathematics knowledge, will not utilize or is unable to apply actually, a part of student feels that mathematics will be as if useless. Mathematics model ling's thought and the method and the process have turned on a channel for the university mathematics teaching, mathematics contacting with outside world demonstrate in front of the student, makes the student to understand mathematics function fully in the solution actual problem's, grasps the utilization of mathematics method. In the establishment mathematical model process, the student can learn with mathematics thinking mode gradually, that solves the problem with the mathematical method in the reality, obtains the raise using mathematics as well as mathematics application ability, mathematics quality has further enhancement.

Mathematics science has been innovating unceasingly, develops unceasingly, mathematics application has been unceasing develops. The applied mathematics already rapidly entered to the modern applied mathematics stage from the traditional applied mathematics. Modern mathematics application scope is expanding unprecedentedly, from domains traditional physics, mechanics and so on expands to domains of biology, chemistry, environment, energy, finance, insurance and so on. Mathematics application has provided the method to solve question for many domains, simultaneously these domains have also provided many concrete question model for mathematics application. Regarding these concrete questions, uses mathematics method, establishes the suitable mathematical model to solve, will enable the student to have a new understanding to mathematics thought and concept and the method of mathematics application.

2 Mathematics Modeling and Mathematical Skill's Raise

In the society, mathematics application has been seeping to all domain, now social become mathematization day by day. Mathematics quality is synthesis reflected of mathematics knowledge and ability. The university mathematics curriculum's educative purpose is through mathematics curriculum teaching, enlightens and unearths the student understanding and the processing mathematics rule, the logical relation and the abstract pattern perception and the potential, achieves the goal in development intelligence and capacity. The so-called mathematical skill, mainly

refers to mathematics power of thought and mathematical computation ability and mathematics application ability. Mathematics power of thought is the function and the characteristic which the unique thinking of mathematics mode has, particularly abstract thinking pattern and thinking in images pattern. Mathematical computation ability consists of mathematics operational capability, data-handling capacity as well as the ability that use computer carries on the numerical analysis. Mathematics application ability refers to the ability using mathematics method to analysis question and solves the question.

Mathematics modeling to the student mathematical skill's raise mainly can realize through the following several aspects. First, mathematics modeling process is also one mathematics training process, through this kind of training, may make the student to set up the explicit quantity idea, knows and pays attention to the quantitative aspect characteristic and the change rule to the thing, sharpens student's logical thinking ability, causes their mentality to be clear, orderliness is distinct, can process the complex work methodically. Next, mathematics modeling is helpful in raises student's mathematics power of thought. Through studies unceasingly, the student has grasped the massive mathematics concept, the conclusion as well as the operational method, how to utilize these knowledge to find that the problem and to ponder question and to analysis question and solve the problem are important components of mathematics power of thought. Mathematics modeling for this mathematics power of thought's inspiration, the development and the utilization has provided an effective platform, causes the student gradually, from not own initiative to from own initiative with mathematics thinking mode analysis and ponder question, seeks the way to solve the question during this process. Third, in mathematics modeling process requests the student in the process to infer each plus sign, each decimal point to be accurate, and each step computation cannot have the mistake, meanwhile must use computer processing and the analytical data. During this process, the student has received one kind work completely different training from the textbook, the operational capability and the use computer analysis and processing data ability obtains the true examination and the enhancement. Fourth, mathematics modeling question directly selects material from the real world, does not have the ready-made method, even does not have the determination answer, the student has to seek the means to solve the question. The student begin to understanding question and to realize question, to unify mathematics which as well as the other aspect related knowledge oneself have, the consult material, pondered with concentration, finally gives the question an answer. Such process will enhance student ability enormously for processing and solving actual problem.

3 Mathematics Modeling and Student Innovation Ability's Raise

Enhancement quality consciousness and training the innovation talented person is urgent need in the entire society to higher education, also will be the College foothold reality, face the future development basic important matter, will be objective

need of the social economy development and the technological progress. The modern society is experiencing historical transformation by the industrial society to the knowledge economy and the information society, thus presented the stern challenge to the traditional educational pattern. The information society is a high tech society, the product renewal speeds up, the work object is changeable, requests the talented person who raises to have the solid foundation, the broad aspect of knowledge and strong strain capacity, requests them to create the valuable new thought that the new theory, the new method and the new technology, thus the request university mathematics education must set up take raises the creativity as the central education for all-around development idea, has the innovative spirit, the innovative ideology and the innovation ability outstanding talent group after group.

4 Takes Function of Mathematics Modeling in the University Mathematics Teaching

Mathematics modeling has the vital role to raise the student innovative spirit and the innovation ability. First, encourages and impels the student in mathematics modeling process to solve the actual problem, but these questions may not have the determination answer and the fixed method, has not assigned the reference book, does not have the stipulation mathematical instrument, even also does not have the ready-made mathematics question. It requests the student independent thinking, to study diligently and repeatedly and to compare notes mutually, forms the corresponding mathematics question, then to analysis question's characteristic, seeks method to solve the question, obtains the related conclusion and judges the conclusion to the correct or mistake, causes the student to gain the valuable experience which is unable to obtain in the books. Next, mathematics modeling process may transfer student's exploration spirit and creation ability, causes them to be more initiative and to be nimble. The student has the very strong seeking knowledge desire, simultaneously also has the intensely request to apply the knowledge one studies, but the pure mathematics instruction often satisfies this kind of request with difficulty. When a realistic question suspends with them, they will then do everything possible to give the conclusion of the question. In the process to solve the question, they meet the further understands and comprehends mathematics concept and the conclusion they have studied, discover inner link between the mathematics concept and the conclusion, develop application scope on mathematics knowledge. Third, through mathematics modeling process's training, may make the student to strengthen the combatant spirit and strain capacity. Through the analysis of the question, grabs the principal aspect of the contradictory, solves the problem finally. Renowned educationalist Mr. Tao Xingzhi once criticized the teaching method “to teach again extremely” in the higher normal school, was said that must give education object certain self-display and the creation space, obviously, mathematics modeling has provided this kind of space for the student. Fourth, mathematics modeling is “the suitable climate” and “the suitable soil” that raises the student innovation ability. The current educational mode, in the majority

time the teacher and the students are in highly tense mechanical in the knowledge instruction, it is very difficult to form the innovative ideology, has hindered to raise the innovation ability seriously. Mathematics modeling created atmosphere on own initiative to be suitable for the student to participate and learn, thus was advantageous to student's innovative spirit and the innovative ideology as well as the innovation ability healthy development. The development to mathematics modeling activity can expand the student mathematics knowledge architecture frequently, and expands the student field of vision, improves student's quality truly, stimulates student's innovative ideology. Final, the different form and the level mathematics modeling activity can stimulate student's competition spirit, the cooperation and the team spirit as well as the seeking knowledge desire, enables student to the healthy development in the body and mind.

The mathematics modeling have the very vital role in the training innovative idea and to raise student's innovation ability, this requests to take the function of mathematics modeling in the university mathematics teaching process, unifies mathematics modeling and the university mathematics' teaching organically. At the same time, must integrate the thought and the method and the practice of mathematics modeling in the university mathematics teaching process .According to the study content, proposed some actual problem close related question to the student, let the student establish the corresponding mathematical model, seeks method to solves the question. Through such regular training, both may strengthen the student mathematical skill, and strengthened the student power of thought, has trained student's innovation ability. In such process, mathematics skill give expression to three stages, exploration stage-observation, experiment, imagination, and implementation stage- inference, operation, indication, and summary stage-abstract, broad, promotion. Through the actual example, the student may understand fully mathematics' significance to study, stimulates student's studies interest and the sense of achievement. We should encourage students that engage in each kind of contest in university student mathematics modeling, takes and emphasizes the importance of mathematics modeling. The university student mathematics modeling activity is one effective way which relates mathematics study and the real life, is also a success attempt for mathematics education educational reform. Teachers must regard this kind of activity as a mathematics teaching method and takes seriously.

The university mathematics education take the quality as the essential target, must take seriously to raise university student's innovative spirit and innovation ability and the practical ability, must display function of mathematics modeling fully in the university mathematics education. The university mathematics' teaching is not only to teach the knowledge to the student, moreover must focus on student's future, focuses student ability to adapts society's.

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Application of PBL Teaching Mode in College Practical Teaching under New Educational Values

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Abstract. For college students, the comprehensive qualities reflect a kind of thoughtfulness and temporal spirit as well as new educational values. This new educational values aim to develop the students' self-learning and self-creation and encourage a joint participation of teachers and students. Therefore, the cultivation of college students' comprehensive qualities should meet the needs of the social values. First this paper analyses some existing problems of the practical teaching in our universities, then discusses the application of PBL (problem-based learning) teaching mode, and finally points out that the full implementation of PBL teaching method and cultivation of high-quality talents are an inevitable trend of higher education reform in China.

Keywords: Educational values, Practical teaching, Teaching mode.

1 Introduction

At present, PBL (problem-based learning) teaching mode is commonly used in the field of medicine. According to the WHO report, more than 1,700 medical colleges throughout the world are using this model. In 1986, PBL was first introduced into China by Shanghai Second Medical University and Xi'an Medical University. In recent years, some medical educators have learned from PBL teaching mode during their courses, however, they are conformed to a single subject and small-scale used. Meanwhile, PBL is rarely used in other research fields, especially in engineering fields.

In view of the above situations, this paper analyzes the application of PBL teaching mode in practical teaching of colleges and universities under new education values with purpose to popularize PBL teaching method and improves the students' innovation spirits and practice abilities.

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2 The Cultivation of College Students' Comprehensive Qualities s Meets the Needs of the Social Values

Educational values are people's recognition and evaluation on educational values and behavior criterion [1]. As people's fundamental views on teaching practices and educational values, educational values are the core concepts of guiding, dominating and evaluating the education behaviors and functions.

In June 1999, the CCCPC (Central Committee of the Communist Party of China) and the State Council issued the "Decision to Deepen Educational Reform and Promote Education in Quality in an All-round Way", which stated that the higher education should attach importance to cultivating students' innovative spirits and practical abilities. This indicate that it is the inevitable requirements of improving the training quality of the talents to cultivate the students' innovative spirits and practical abilities and improve the college students' comprehensive qualities, which can meet the needs of the higher education in the 21st century.

For college students, the comprehensive qualities reflect a kind of thoughtfulness and temporal spirit as well as new educational values. This new educational values aim to develop the students' self-learning and self-creation and encourage a joint participation of teachers and students. It may be promoted to a high level theory to dominate the implementation of education. Meanwhile, it might exert a subtle infiltration to educator affecting their behaviors. Therefore, the cultivation of college students' comprehensive qualities should meet the needs of the social values [2].

3 The Problems of Practical Teaching in CHINA

The practical teaching plays an important role in realizing the education objectives of personnel training and it also shares a significant part in improving the students' comprehensive qualities, innovation spirits and practice abilities. However, there are many problems in practical teaching nowadays in China.

3.1 Subjectively, Not Enough Attention Is Paid to Practical Teaching

Many colleges and universities regard course designs and course practices as the subsidiary work to the classroom teaching and the practical teaching usually lacks the participation of the experienced teachers, an overall design to the practical teaching and necessary attention and guidance to the comprehensive and designing experiments.

3.2 Objectively, Off-Campus Practice Has Many Difficulties and Costs Much

Due to the constant changes of the external conditions and capital shortages, the practical teaching in some universities is just a mere formality and usually ignores the students' specific needs.

3.3 Insufficient Students' Active Participation in Practice

At present, the practical teaching activities are mostly arranged by the universities and teachers and often the students are passive recipients. The insufficient active participation of the students will definitely affect the training quality.

3.4 The Implementation Form Is Not Plentiful

The practical teaching now in China fails to take full advantage of modern information technologies and is still confined to internship, experiments, observations, course designs and graduation designs, etc. lacking new practical teaching forms which can really simulate the actual combat training.

3.5 The Classroom Teaching and the Practical Teaching Are Not Well Combined

Our classroom teaching and practice teaching are not well combined. The effects of the practical teaching are difficult to evaluate because of the imperfect establishment of the case library. In addition, the relevant research on practical teaching is far from adequacy, which is bound to affect the development of the practical education in China.

4 The Application of PBL Teaching Mode in Practical Teaching of Colleges and Universities

Problem-based learning (PBL) is a student-centered pedagogy in which students learn about a subject in the context of complex, multifaceted, and realistic problems, which were pioneered by Barrows, an American professor of neurology in McMaster University of Canada. PBL has the following characteristics [3].

Firstly, PBL emphasizes the students' active learning instead of the traditional teacher-centered education; Secondly, PBL teaching method is problem-based and links learning to larger tasks or problems. Meanwhile, PBL is student-centered and teacher-directed, which aims at developing the students' abilities and mobilizes the students' initiative and enthusiasm; Thirdly, PBL insists that the designing tasks should be authentic and the whole learning process should be put into complicated and meaningful problem situations to cultivate the students' problem solving skills and autonomous learning abilities by developing their independent inquisition spirits.

4.1 The Way of PBL in Practical Teaching

With the increasing proportion of practical teaching, traditional teaching patterns have been constantly broken and various value-oriented practical teaching models are gradually introduced into college classes. The author has tried using PBL teaching method during her classroom teaching and the mode of carrying out this method is as follows [4]:

Formulating PBL Plan by Panel. First, the panel should formulate an actual PBL teaching plan, which can be a single course design or graduation design after careful planning and continuous arguments. The selected project may be all types of real estate projects (such as residences, office buildings and commercial facilities, etc.) or engineering projects (such as houses, power stations, water plants, factories, sport facilities, roads, bridges and tunnels, etc.). The students are required to fulfill the scheme's planning and design of the whole or the main process, including market research, positioning, planning, implementation, financing, operation and maintenance.

Training Teachers. The teachers (course design or graduation design guide) need to be trained to understand the latest development and essence of PBL. In PBL teaching method, the management between teachers and students should be target-oriented and the whole learning process should primarily be the students' self-learning, investigation, discussion and cooperation.

Instructing the Students' Designs. The students should be divided into various groups and each group consists of 4~6 students and assigned one as group leader. Each group discusses their topics and specifies its division of labor. The students of each group respectively collect materials, discuss topics, propose solutions, write research reports and complete design requirements according to their selected topics. During the process, the groups must report their progress to their tutors at regular intervals.

Means of Assessment. In the final stage, all the students get together to report their design results in groups and each student should report on his/her work respectively. The written report of each group accounts for 60% (mainly given by the teachers); the oral report makes up 30%; Individual's contribution to the group takes up 5% and the special allowance for personal oral report accounts for 5%.

After careful preparations, all the groups should report their research results in PPT forms. The report mainly includes the project's brief introduction, the problem analysis and solutions to these problems. The report time of each group is limited to 30~40 minutes and each group should choose a representative to give a group presentation. Additional five minutes will be allowed for each group member to supplement his/hers research.

The Tutor's Comment. At the end of the report, the tutors should give their comments and summaries as well as the key knowledge if needed. They should enlighten the students by guiding them to a deep consideration and make the education benefit teachers as well as students.

4.2 The Significance of PBL in Practical Teaching

Based on the experiences of PBL teaching method in engineering management of Henan University of Urban Construction, China (HUUC), the author believes that PBL has the following advantages compared with traditional teaching methods.

Strengthening Comprehensiveness of Design Content. PBL plan made by the panel covers related knowledge and technology and has a greater depth and breadth in contents, which can strengthen the training of students' comprehensive qualities and cultivate their practical capabilities and innovation spirits.

Flexible Teaching Forms and Design Time. All the current practical teaching, such as course designs and graduation designs, nearly occupies the whole class teaching and restrict the students' initiative. However, PBL doesn't limit teaching and learning to the class teaching, which is successful to streamline class and arouse the students' subjective initiative as well.

Cultivating the Students' Self-taught Abilities and Problem-solving Skills. Students-centered learning in PBL teaching directly affects the effects and quality of learning. It can not only let the students develop their full potential but improve their self-control consciousness, which encourages all the members to bear their responsibilities. Therefore, PBL can cultivate the students' self-learning abilities and their capabilities of analyzing and solving problems, which has laid a foundation for their future work.

Training the Students' Leadership and Team-work Spirits. The team-work spirit is an important part of the contemporary college education. PBL lets the students gradually possess the corresponding leadership and team-work spirits and enables them to effectively finish their own tasks through the division and cooperation between group members.

A Diversity of Evaluation Methods. Unlike a single assessment of traditional practical teaching, PBL has a diversity of evaluation methods. For instance, it not only concerns the assessment results but also cares the evaluation process; it contains the teachers' assessment as well as the students' assessment; and it examines the team's efforts while evaluating the individual's performance.

5 Conclusions

It has been found that the graduates of Engineering Management in HUUC (Henan University of Urban Construction) maintain a continuous high employment. The employers generally give praise to the solid professional knowledge, strong practical abilities, high comprehensive qualities and eminent team-work spirits of the graduates. Therefore, the full implementation of PBL teaching mode and the strong cultivation of the high-quality talents will become an inevitable trend of the higher education reform in China.

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Employment of College Students Research Based on Long Tail Theory

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Abstract. Student employment is a hot and difficult problem of society. Long Tail theory is a new and prominent theory in economics, and the application of Long Tail theory into the work of higher education provides a new perspective to improve college employment. The process of college student employment just provides the necessary conditions for the appearance of power law curve of the Long Tail. In this paper, the application of Long Tail theory are divided into three aspects to promote development of college student employment : Reform the traditional training model to cultivate talents of Long Tail society needs, build the long tail theory-based career guidance system, let universities and enterprises share information freely and cooperate in personnel training.

Keywords: Long Tail theory, college students, employment.

Introduction

With the increasing number of college graduates, the university students are faced with more and more challenges their parents and grandparents had not met. College students are a group of people who have relatively high quality and sound knowledge, which makes them precious resources for the lasting prosperity of a nation. However, college students' employment problem has become a hot issue which caught much publicity among universities and society [1]. In the background of rapid development of economy, furthering reform in employment system and deterioration of the general situation of society employment, it is of great significance to find a way to solve the problem of college student employment. As an emerging theory in economics, the Long Tail theory when applied into the work of higher education provides a new perspective to improve the situation of college student employment.

1 Connotation of the Long Tail

The Long Tail coined by Chris Anderson, the editor-in-chief of a famous American magazine on Internet called Wired, was first appeared in Wired October 2004.

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After a deep and all-around analysis on the book sale distribution from Amazom.com, Anderson got a graph in which sales change with the type of book.

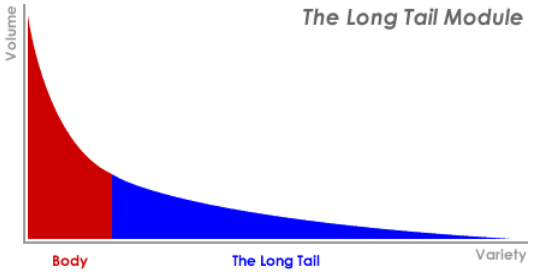

Fig. 1. (Note: Body zone is the sales volume of best-selling book. The Long Tail zone is the sales volume of non-best-selling books which have many varieties.)

From this graph, we can see that about 20 percent of the variety is bestsellers, which, however, occupies nearly half of the total sales. And the non-best-selling books which have 80 percent of variety occupy half of the other. Based on this phenomenon, Chris Anderson introduced his famous theory of The Long Tail: Products in low demand or that have a low sales volume can collectively make up a market share that rivals or exceeds the relatively few current bestsellers and blockbusters, if the store or distribution channel is large enough [2].

The Long Tail was considered subversion of the "20/80rule". The traditional "20/80rule"was stemmed from an Italy economists Pareto, who drew the conclusion from statistics that 20 percent of the population owned 80 percent of the whole social wealth. The conclusion showed an imbalanced relation, which the minority (or something else) who were the mainstream can cause the significant and major influence. However The Long Tail theory pointed out that the neglected 80 percent can collectively produced a huge force. Products in low demand or that had a low sales volume could collectively make up a market share that rivaled or exceeded the relatively few current bestsellers and blockbusters, if the store or distribution channel was large enough. Not long after the theory was introduced it was widely applied to many fields, which finally caused big effect. It had profound significance in book marketing, network publishing and education management.

2 Analysis under the Perspective of the Long Tail on the Problems in the Process of College Student Employment

The long tail referred to the power-law curve, which couldn't be cut off by the bottleneck of supply. The range of the curve infinitely neared the horizontal axis but never dropped to zero. In addition, as long as there was consumer market existing, power-law curve could appear, if the three conditions were met: 1.diversity 2.inequality 3.there is a certain network effect, such as reputation or oral

communication effect, which could easily doubled the amplification of quality difference [3]. After we connected the three conditions with the process of present college student employment, we found that it exactly provided the necessary conditions for the power-law curve to appear:1. The diversity of college students' employment expectations or channels and the levels and types of enterprises coming to colleges to recruit. 2. College students vary in quality and ability, particularly in the development of individuation. 3. The university campus network and the word-of-mouth ability of college students could double the amplification of quality differences of enterprises. So the existence of long tail effect in the college students' employment process is inevitable. However, there were many problems still existing in the process at present.

2.1 The Society Attached Too Much Importance to the 20 Percent Composed by the Social Elites, Ignoring the 80 Percent Composed by the Groups of Ordinary College Students

If the college students were described as the special "product" of higher education, then the social demand of traditional "elite talent" was very large. So the ordinary university graduates more or less would meet difficult problems of employment. But social economic development did not just need elites, but also needed different levels and types of professional personnel and high-quality workers or even laborers willing to work. If 80 percent of the university graduates could use their own unique talents to find suitable jobs in different industries and enterprises, then these dispersed groups would possibly contribute as much as the elites do or even higher than them. That was in spectacular agreement with the basic connotation of The Long Tail theory, namely, the substantial small markets could collectively generate great market force that could rival the mainstream market. In the university level, usually school paid too much attention to elites or outstanding students who were in a minority when came to personnel training and employment guidance, while it lacked training and instruction for ordinary students who were in the tail of the curve and have difficulties in finding a job. So in terms of the right students should get, there existed much unfair phenomenon between the ordinary student groups and the outstanding students.

2.2 College Graduates and Universities Themselves Attached More Importance to the Hot Enterprises or Institutions and Neglected the Small and Medium-Sized Ones

Employment enterprise or business unit, despise attention popular. From student level, they failed to use the Long Tail theory in the process of job search, just staring at hot enterprises and popular positions in coastal developed regions which were in the head of the Long Tail curve. But usually the competition in those areas were very fierce, always too many candidates for too few positions. They

discounted the areas, such as the substantial small and medium-sized cities located in the Midwest that were in the tail of the curve, which might provide appropriate positions for them. So it was graduates themselves who set up a barrier that finally made them lose the potential opportunities for their job search. From college level, universities often contacted and received enterprises, institutions and foreign enterprises that had a good reputation or ranked in the head of certain fields with high standards, while the private and foreign invested enterprises that had a very large number and in the tail of the power law curve were neglected. Although this kind of practice could keep a small amount of large enterprises and institutions for school, it cost a huge amount of manpower and material resources only to solve the minority students' employment problems, losing large amounts of recruitment provided by small and medium-sized enterprises or units in the tail of the distribution.

2.3 Enterprise Attached Too Much Importance to Key Universities and Discounted the Average-Level Universities

According to the latest statistics from Ministry of Education, there were 1108 undergraduate colleges and universities in China, of which 996 were the local universities or college. There were also 1239 higher vocational schools across the nation. So the local colleges and universities were the major force in the popularization of higher education. In making recruitment plan enterprises often gave more attention to the head of the Long Tail curve composed by higher ranked "985, 211 key colleges and universities", ignoring the second-class and third-class colleges and vocational schools in the tail of the curve. Even a small position didn't require much competence was wanted to recruit candidates from key universities, thus leading the waste of talent. In the background of popularization and homogenization in the cultivation of college students, enterprises often paid the huge recruitment cost but couldn't find the right students wanted and even couldn't keep the outstanding students from key university because the job had no technical content.

3 Use the Long Tail Theory to Boost the College Student Employment

From the above analysis on the relation between the Long Tail theory and the university student employment, we knew though the Long Tail theory was an economic rule of the Internet Age its core ideas could also be applied to the field of employment with the high developed network. For the work of university student employment, we could use the Long Tail theory from the following several aspects to promote the development of graduate employment.

3.1 Reform the Traditional and One-Sided Personnel Training Mode and Cultivate "Talent of the Tail" That Enterprise Needs

The head of the long tail referred to outstanding students who had a coordinated development with knowledge, quality and ability. In the end of the long tail accordingly referred to the students with social satisfaction, namely one who had tendency of certain ability and special personality. To implement talent cultivation of the Long Tail theory, the core was to enlarge the head of long tail curve, namely training elite and outstanding students. At the same time attached more importance to the end of long tail curve so as to cultivate personalized talent for the market. Reform the personnel training mode, update curriculum system and its content, strengthen students' comprehensive quality and competence, and improve students' practical ability, creativity and employment ability. Those were what should be done to enlarge the head of long tail curve. At the same time cultivating "talent of the tail" that enterprise needs couldn't be neglected [4] .Colleges and universities could apply the Long Tail theory to talent training, through which we would resolve the contradiction between universality and individuality. In addition, by providing different modules for curriculum system and guiding students to choose appropriate training methods, we could meet various needs of the students and enterprises and solve the paradox that graduates couldn't find their suitable jobs while enterprises couldn't find the staffs they really need. University also should change the one-sided personnel training mode, so it would let every college student learn what he or she wanted and eventually find the right job in the market with sophisticated industrial structure.

3.2 Build the Profession Guidance System Based on the Long Tail Theory and Strengthen Guidance on Employment for College Student

The effectiveness of cultivating talent of the Long Tail was depended on the process of training and the choice of career development guidance system. Social demands and the choices between talent show bidirectional traits, namely social enterprises selected the suitable talent and university graduates also chose their own enterprises which were suitable for them. The higher degree of diversification of talent, the more choices enterprises would have, and the more obvious advantages of dislocation competition college graduates would show. To build the profession guidance system based on the Long Tail theory the first step was to assure that the profession guidance system should run through the beginning of the freshman year to the final graduation from college. Through this process students could choose appropriate learning development plan in accordance with their own interest, hobbies, specialty and employment expectations. The second step was to strengthen the communication between teachers and students. Besides the profession guidance curriculum and services provided by the professional career guidance teachers, student instructors, student administration teachers and even the

tutors should participate in students' employment guidance and career planning system. They should classify the different types of students and use various potential occasions and channels to provide students with personalized instructions, especially pay attention to the students who were in the tail and to make every college student have a clear career planning blueprint.

3.3 Sharing the Information between Enterprises and School for Cooperation in Personnel Training

University-enterprise cooperation is the best way to cultivate the Skilled Talents. For college, University-enterprise cooperation is benefits for further improving of the quality of college education, promoting and enhancing the vocational ability of the graduates in the tail, ensuring the graduate with skills to business requirements, adapting working environment fast, truly realize the distance-free employments and avoiding the conflicts in detaching between teaching and business needs Effectively. For enterprises, thanks to the support from the college cooperation in the tail, Enterprises obtain the large quantities of appropriate personnel for extraordinary developments. And the colleges are important bonds of society, play an crucial role in contacting with thousands of families, Enhancing their visibility and reputation in society, improving the impression of enterprises and their products and promoting the economic benefits increasing continually. For the students, according to the University-enterprise cooperation and Practices in positions, they will fully understand the future career path. The Ability to adapt to positions, vocational comprehensive quality of students in the head raw and tail are both improving. Eventually, reach the goal of boosting the rate of employment [5].

4 Conclusions

It is an eternal theme in the higher education that improving the training quality of cultivating qualified personnel. By using Long Tail Theory, the process of university students' employment provides a new perspective about the relationship between enterprise and universities, and the Long Tail Theory which is applied to solve the current employment difficulties is also an effective method. Each university should specifically clarify their respective employment orientation, explore for college condition and the pattern of economic and social development in personnel training, improve the construction in guidance team of the employment, increase the investment in constructing the system of employment service, enhance university-enterprise information cooperation and construction work, meet the diverse talents needs of economic development. Finally, we could provide large quantities of outstanding professional talents and high-quality workers in all walks of life.

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Preliminary Study on the Ethical Issues of Engineering Activities

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Abstract. Engineering activity is a complex social system project which the decision-making, design, implementation and evaluation may involve the political, cultural, moral, legal and ecological environment and other aspects, containing deep ethical issues. It reflects the relationship between man and people, man and man, man and society. This article based on the analysis of several cases in order to clarify the ethical issues of engineering activities in a more vivid and direct way. Engineering activities brought greater or lesser extent to the natural environment, social development and the public life. At the same time, people who played a leading role in the engineering activities inevitably had their own value judgments and emotional tendencies; therefore, ethical problems in engineering process were an objective reality which can not be ignored.

Keywords: Engineering, Engineering activities, Ethics.

1 Introduction

Engineering activities carries the political, economic and cultural value. Engineering activities must adapt to the model of the social development in contemporary, and it should integrate systematically some factors such as, scientific, technical, economic, social, and environmental to develop and implement. Currently, the ethics of engineering activities is becoming more and more apparent. Limited space limitations, this review which focuses on ethical issues in engineering activities is classified as: public security, ecological security, the "justice" of engineering activities, engineer's "conscience" and "responsibility" and some other aspects.

This article based on the analysis of several cases in order to clarify the ethical issues of engineering activities in a more vivid and direct way. Engineering activities brought greater or lesser extent to the natural environment, social development and the public life. At the same time, people who played a leading role in the engineering activities inevitably had their own value judgments and emotional tendencies; therefore, ethical problems in engineering process were an objective reality which can not be ignored.

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2 Engineering and Public Safety

Public safety in this context means the public nature of the project which may bring some personal, property and other aspects in security issues to the stakeholders, during the construction process and after the completion of construction.

Engineering activities related to public interests and community safety. Only project actors participate in engineering decision-making, design, implementation, evaluation process with the spirit of responsibility, there will be constructed in accordance with the public interest to make people satisfied with the project.

Case 1

The thinking of the responsibility of construction supervision of school buildings collapsed from the earthquake in Wen chuan [1] Wen chuan earthquake happened on 12th May, 2008 which shocked the half of China and the whole world. The most shocking was that one after another school buildings overall collapsed. Only the teaching building of Bei chuan Middle School collapsed, the number of dead and missing was more than 1,000 people. At the same time, we had also seen some great contrast phenomenon, for example, Fu xin Second Primary School in Fu xin town where this was not the most earthquake-hit areas, but it was the most serious collapse of the town. The buildings around Ju yuan Middle school did not collapsed, and the serious only become dangerous after the earthquake. However, a house of 20 years old next to the Bei chuan Middle School survived, including the next three buildings. There also included Liu han Hope Primary School 15 miles away from the Bei chuan county sought after by the media as "the most powerful in the history of Hope Primary School", Because the school buildings began to be used in October, 1999 in this earthquake without any collapse, and the 483 students and 28 faculty of this school were all evacuated miraculously.

According to a person in charge of the school" in fact, the basic construction cost of this building was not high, maybe it was all because the highly responsible of the supervisor and the builder." Chen Baosheng, a professor of Tong ji University, who was also a relief expert in ministry of construction spoke frankly, "our functions, our planners, architects and structural engineers should reflect the fact so many children died" after surveying the Ju yuan Middle school in ruins..

Some thought to be triggered after large number of school buildings collapsed in the earthquake as follows.

The first, whether the project management should increase the intensity in the use of safety supervision of the buildings? The second, who was the ultimate customers of the project management?

The third, whether the project supervisors need to further strengthen the sense of responsibility?

The fourth, whether or not further improve the technological level against earthquake and the ability to control quality of the project supervisors?

The phenomenon of school buildings collapsed in the Wen chuan earthquake caused by the combined effects of multiple causes. For example, houses were not in accordance with the anti-seismic standards of construction, the poor anti-seismic performance, seismic intensity beyond expected, the poor quality of the project, and so on.

As long as each one of our staff involved in project construction bore in mind their responsibility in daily work and strictly controls of every building aspect, there would be some “anti-seismic” schools.

3 Engineering and Ecological Safety

Ecological security means the health and integrity of ecosystem conditions, the level of protection from ecological destruction and environmental pollution in terms of the production, the life and the health of human, etc. It includes drinking water and food safety, air quality and green environment, and other basic elements.

Case 2
Oil spill in the Gulf of Mexico [2]--the most serious environmental disaster for decades in the United States Explosion of a drilling platform resulted in a large area of oil spill close to Louisiana on the Gulf of Mexico on 20th April, 2010. U.S. media said the oil leaked into the sea needed five years to clean up, and the ecological pollution caused more worrying. Relevant people said although the sea had the ability of the world's strongest self-purification, however, the sea can only change color in the face of oil pollution, an eco-killer.

When a large of fish died from crude oil pollution, it was also difficult to measure the serious damage of the seabird resource. Some analysts believed that this oil spill would seriously threaten the survival of hundreds of species such as fish, birds and other creatures in the Gulf of Mexico. The Gulf of Mexico was an important source of seafood accounting for 20% of U.S. seafood, what is more, the shrimp production accounted for 75% of the nation. When the leakage of crude oil was brought onto the coastal belt, oil would pollute the clean beaches and caused damage to the landscape, which was a fatal blow for those the tourism industry as the pillar industry of nations.

There were two sources of marine oil pollution, and one kind was natural sources, mainly from the decomposition of biological metabolism or death and undersea oil leakage, etc. Another kind was due to human activities, mainly from shipping, oil and gas exploration at the sea. Shipping leakage was a major source of pollution. According to statistics, from 1970 to 1990, tanker accident occurred as many as 1,000 cases. There were 10 million to 15 million tons oil into the sea every year.

4 The "Justice” of Engineering Activities

Engineering is composed of many interest groups such as, the project investors, project designers, project implementers, project beneficiaries and ones interests impaired. Therefore, project activities involve the distribution of project benefits, and the sharing of engineering responsibilities. To some extent, a "good" project is a "fairness and justice" project.

Case 3

The nuclear waste landfill leaked slowly 25 million people may be affected In normal, people referred to nuclear waste including the low-level radioactive nuclear waste and high-level radioactive nuclear waste. The low-level radioactive nuclear waste mainly referred to the radioactive waste liquid, waste in the process of nuclear power generation, which accounted for 99% of all nuclear waste. The high-level radioactive nuclear waste was the combustion of nuclear fuel replaced from the reactor core in nuclear power plants, because of its highly radioactive, commonly known as high-radiation materials. The hazards of low-level radioactive nuclear waste were lower, and it was accepted that about 10-20 meters deepening trench on the ground, then building projects of various radiation protection barriers and burying the nuclear waste in sealed cans into it. Over time, the radioactive material of these wastes would decay into the harmless substances. This method had been developed for several decades, and the technology was already very mature and security was also guaranteed. High-radiation materials are harmful to human health with a variety of high-radioactive elements. The half-life of these high-radioactive elements up to tens of thousands to hundreds of thousands of years, it would be devastating effects to the local environment if not properly disposed of. Currently, in order to solve this problem, countries had generally adopted the following methods, directly putting the nuclear waste to developing countries, throwing the nuclear waste into the open seas, trying to dispose the nuclear waste in their own countries. However, ether way can not satisfactorily solve the problem. [3]

There were some inaccessible mountains in New Mexico, where all types of radioactive waste were stored in the landfill. 60 years later, some nuclear waste buried in the ground began slowly to leak, posing a threat to some nearby water sources, and the health of 25 million people downstream might be affected. "Los Angeles Times" reported that the U.S. government said the extent of leakage of the nuclear wastes stored in these regions "not enough to cause harm to the health of nearby residents". Ross Alamos nuclear weapons laboratory in local claimed that a small part of radioactive waste leaked diluted by the river or deposit on the seabed, so it can easily be removed.

Nevertheless, Ross Alamos nuclear weapons laboratory would still do some security checks for the more than 2,000 radioactive waste landfills in the mountains by 2015. At present, Ross Alamos nuclear weapons laboratory was responsible for the development and production of key equipment of nuclear weapons, known as “National team”. In the next few years, the laboratory would invest more than two hundred million U.S. dollars to handle all types of radioactive material. [4]

5 Engineer's "Conscience" and "Responsibility"

In the 8th meeting of "the China and the 13 South Korea (East Asia) Engineering Academy Round Table”, Xu Kuang di, the dean of Chinese Academy of

Engineering, Hither Junichi, the dean of Japanese Academy of Engineering, and Lee Ki-jun, the dean of the South Korea Academy of Engineering jointly issued the "Proposition on the Engineering Ethics". They hoped" the engineers took steps according to their conscience in their business activities, in some aspects such as public safety, health and well-being and so on", and requested the engineers "In their business activities, abided by high ethical standards in order to contribute to social well-being and improve people's lives".

"Conscience" was a understanding and evaluation of the right and wrong, good and evil in people's hearts about their own behavior, was also a sense of moral responsibility and self-evaluation capacity during fulfilling the obligations of others and society. It reflected a moral belief, self awareness, playing a role of judgment, guidance and oversight for the people's behavior. Therefore, to some extent, the "conscience" was related with the "responsibility". Some phenomena in engineering activities such as Jerry-build, illegal operation, the absence of supervision which reflected the "conscience" missing of the engineers and people associated with engineering activities. A qualified engineer must abide by professional ethics and professional conduct, Responsible for the project, doing the "conscience" project, "rest assured" project.

Case 4

Feeling of being unfairly treated the engineer of "Discovery" resigned at the critical moment [5] on 26th June, 5 days remaining before the "Discovery" launched, a senior engineer responsible for the shuttle program in NASA suddenly submitted his letter of resignation, so people began to pay attention to the space shuttle was launched soon. According to NASA sources, the 30-year-old senior engineer named Kama Da was subjected to "unfair treatment" and chosen to resign because of expressing concern on the upcoming launch of the "Discovery".Kama Da was the specialist responsible for the mission of the "Discovery" at last year, as a very important role in this mission.

"Discovery" launching was scheduled for U.S. Eastern Time on July 1, this would be the second launch after the accident of the "Columbia". Not long ago, O'Connor, NASA's chief security officer, was worried about the hidden dangers about the "Discovery" and against the "Discovery" re-launch, because the insulation foam shedding problem was not resolved and would become the potential threat for the "discovery". For this launch is scheduled on 7th July, O'Connor felt not at ease, but accepted the decision, because NASA developed a security plan which once there was a security threat on the "Discovery" caused by foam shedding and damaged insulation largely, astronauts could be "refuge" in the International Space Station and waited for aid.

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Research on the Human Resource Development of Rural Women — Take the Example of the Rural Women in Shuangliu County of Chengdu

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Abstract. The construction of the new socialist countryside is a significant mission in the procession of the modernization in China. As more and more rural labors find jobs in urban areas, the rural women, whose condition is directly concerned with the realization of the goal in the new socialist countryside construction, become the main stream of the construction of new rural areas. Most of the researches focus on the development of rural labor and few researches emphases the function of rural women. This article adopted the way of questionnaire to investigate development of human resource of the rural women in Shuangliu County of Chengdu city. After the statistic analysis, it makes the conclusion that it is necessary to change the old idea for treating rural women and the government should help enhance their own conception of self-development.

Keywords: human resource, rural women, education, Shuangliu County.

1 Introduction

China is a large agricultural country with a population of 63.91% in rural area. The state premier Wen Jiabao points out that the problems of agriculture, country, and peasants are the fundamental questions relating to the modernization of the country. There is no longer much difference between the urban and rural areas in developed countries, for dual structure has basically eliminated. In developing countries, rural areas are behind the city seriously for a long-term, which will limit the country's economic development eventually. Solving the problem of "Issues of Three Rural Issues" and promoting the development of urban and rural unifinication are anther difficult problem to enhance China's current economic and social development.

As a Western typical "big city with a large rural" area, Chengdu, with 1.1 million people, accounts for more than 0.6 million rural population. There is a big gap between urban and rural areas. The Chengdu municipal government made a positive exploration in the path of integration in urban and rural areas. In June 2007, Chengdu was approved by the State council to be National urban and rural comprehensive reform pilot area, which is another one after Shanghai Pudong New Area, Tianjin Binhai New Area. There will be more preferential policies given by

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the State to promote reforms and Chengdu government would also introduce more policies for this. As in the development of the rural place, rural women have played an important role. They are the labor force for the agriculture production, they have the responsibility for education of the next generation, and they are also the backbone of rural secondary and tertiary industries. Therefore, to exploit the human resource of rural women is an important problem to quicken the development of rural area. In this paper we choose the rural women in Shuangliu County, one of the country's one hundred best counties and typical in the process of integration in urban and rural areas, to do this questionnaire and use Delphi technique to analyze the result.

Hence, the objectives of this study are:

To analyze the result of questionnaire

To get the conclusion and give suggestions to exploit the human resource of rural women.

2 The Respondents and Research Methods

The study conducts with 400 questionnaires sent out and 335 (97.01%) available questionnaire was retrieved, including the rural women aged at least 18. The majority is the women from 26 – 45years old, and the proportion is 76%.This age level of women is the backbone of human resource in rural areas.

3 Analyses of the Survey Results

3.1 State of Health

Physical health directly related to the development and sustainability of human resource, and also is the prerequisite and foundation in human resources development. There are 160 people (52%) consider themselves in good physical condition, 135 people (44%)were considered normal physical, and the 12 (4%)people are in poor condition Most women consider their body are in a good condition, which makes necessarily foundation of the human resource development.

3.2 State of Education

Human resources mean the people who have a normal physical and mental health, including four parts-- energy, intelligence, knowledge and skills. Intelligence is mainly determined by genetic gene, and most people are within the normal range of intelligence. Knowledge, as an important part of human resources, is the decisive factor of human resources. Knowledge can be acquired through learning and can be reflected by the educational level.

According to the results of the survey respondents, 56% of the respondents got junior high school education, each 19% get the primary and lower education level or high school education. It is noteworthy that in the survey, only 18 rural women got the college and above education, 6% of total number. It shows that the popularization of Nine-year compulsory education did receive some results, and the

Table 1. The level of education

The percentage level of education	The number of people	percentage
primary school and below	62	19%
junior high school	183	56%
senior high school	62	19%
College and above college	18	6%
Total	325	100%

overall national level of education has increased than before, but the education level of women is still very low.

Mother always play an important role in the family education .In this survey, we clearly see that the study guidance of the respondents to their children is similar to their own education level, centering on primary, secondary study, respectively, 43% and 25%of the total. Of course, the women who get higher education are helpful for their children's study. If they got higher education, there is no doubt that their counseling capacity would increase, and they would pay more attention to the development of children' psychology and comprehensive quality. Studies have shown that the more mothers get higher education, the higher enrollment rate of the girls would reach.

3.3 State of Mastering Skills

Human resources skills are another important part of human recourses, which can be obtained through short-term training. Its promotion has direct function for employment and income .In this survey, nearly 1 / 3 of the respondents have nothing addition skills besides farming skills, which seriously hindered the fully utilization and development of the rural women human resources .Nearly half of people think that lacking of skills is the biggest obstacle to work out. "

Table 2. The condition of master the skills

The number of master skills	Number of people	Percentage
none	98	30%
One kind	133	41%
Two kinds	81	25%
More than two kinds	13	4%
Total	325	100%

On the whole, most women only finished the basic education, and they did not receive a higher level of technology or vocational training. The result is they must stay at home for lacking of labor skills. While in the process of “urban-rural integration", these people become "landless peasants", who had no field to cultivate or no technical working skill to go outside. Thus, the surplus labor in rural areas rose steeply .The issue of working capacity improvement, job creation, transfer of surplus labor will matter the rural social stability and steady economic development.

3.4 State of Employment

Employment is the best way for women to realize self-worth and also the direct way for human resource development. Effective employment can not only increase income and promote their abilities, but also promote local economic development and improve rural folkways. The survey found that the work of rural women are still mainly in agriculture, accounting for 58% of the respondents (187), 21 %(69) for industry and 7% for self-employed.

Table 3. Work distribution

Occupational	Number of people	Percentage of career
farmers	187	58%
manual workers	14	4%
skilled workers	16	5%
Service staff	39	12%
Self-employed	22	7%
Others	47	14%
Total	325	100%

This shows that most women are still doing the traditional field working. The employed women are at the plight of low employment rates and employment levels of most families surveyed remains in the traditional agricultural household, and their consumer source still relies on agriculture income. In the process of "urban-rural integration", the government should consider those original ideas, concepts, methods, standards of living in order to better achieve the target.

4 Conclusions and Suggestions

Based on the above investigation, most of Chengdu rural women appear to be physical health and lowly education degree. They can only engaged in agriculture without professional skill. The situation shows that there has great potential for the rural women's human resources development. As Chengdu being the pilot area,

the all-round development of rural women can not only increase the agricultural income, but also speed up the integration of urban and rural areas.

The government should pay more attention to rural women, spread the fresh idea and give support to the self-development of rural women. Since the founding of PRC, the gender discrimination in rural areas in China has been greatly improved already, but it still exists in a certain extent. The idea can not to be changed overnight .Therefore, the government should try to disseminate the importance role of women and take effective measures in the aspect of leader appointment, industry adjusting and daily issues.

The government should develop vocational skills training to improve the overall rural women's quality. Strengthen the investment of education is an important way to develop human resource. The government departments should established training center for rural women to choose appropriate skill, At the same time ,the government should also encourage the rural women in weaker position to study knowledge and technology in order to increase family income and get their children have better education.

The government should strengthen the construction of rural democracy and legal system, protect their legitimate rights. In our survey, we also found that rural women are in a weaker position in the family, some are even subject to different degrees of domestic violence, who are still lack of official position in grass-roots autonomous institutions. In the process of urban-rural integration, Women's rights must be guaranteed.

At last, the government should formulate appropriate laws and regulations to guarantee women's political and economic status, establish departments to protect and support women's physical and mental health. In this way, their enthusiasm can be aroused and the process of integration can be quickened.

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Promoting Blended Learning Strategies Based on the Participatory Instructional Design Concept

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Abstract. Blended learning, namely the combination of face-to-face teaching with computer aided on-line learning, has been proven to be an effective way in study, but still lower utilization in China's institutions of higher learning, mainly because of teachers' ideas and information literacy. Participatory instructional design theory is a new education teaching theory which arose in the late 20th century and refers to students' participation in the teaching design process, planning together with faculty and other students and generating activity results. Based on the theoretical guidance of participatory instructional design, this paper explores a strategy of promoting blended learning, that is, by student's participation and assistance, teachers use, develop, and form their blended learning concept in teaching practice.

Keywords: blended learning, participatory instructional design, student training, student assistance.

1 Introduction

As the information age has come and the shortcomings of traditional education method been found, modern learning theory of constructiveness learning process appears. Participatory instructional design theory arose in this condition in the west in the late 20th century, which refers to students' participation in the teaching design process, planning together with faculty and other students and now has been carried out in some schools in the U.S, Britain, Spain and other countries, and remarkable achievements have been achieved. But in China, the research is still in its early stage. Blended learning is a kind of learning method, namely the combination of face-to-face teaching with computer aided on-line learning [1], which combines traditional teaching advantages with digital learning advantage, better guides students thinking and learning process, and thus helps to increase students' learning depth, cultivates self learning ability and enhances both teachers' leading role and students' subject status goal.

In American universities, blended learning method is used much more than in China, some specific cases have proved that blended learning can improve

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students' learning effect, reduce school funds [2]. In 2009, the Department of Education of the U.S. completed a research: a systematic search of the research literature from 1996 through July 2008 identified more than a thousand empirical studies of online learning. Analysts screened these studies and found that contrasting blends of online and face-to-face instruction with conventional face-to-face classes, blended instruction has been more effective. But these blended conditions often include additional learning time and instructional elements [3]. In recent years, Chinese education workers have been carrying on many studies in blended learning, such as effective blended learning teaching pattern, using effect analysis in some courses and so on. However, blended learning utilization rate in China is lower. From the development perspective, blended learning not only helps improve the study effect, but also the teaching hour insufficient and save the cost of higher education institutions and operating efficiency. Some scholars think that blended learning is the motive power of school organization transformation and the force of promoting higher education qualitative change. Some digital learning experts predict that by 2020 most of the courses in higher education will be offered in blended learning style. Therefore, blended learning, as an era product and important future development trend, deserves attention. At present, network infrastructure hardware conditions in China's universities are fine and suitable for conducting blended learning, the difficulty lies in the teachers' teaching idea, information literacy and the related national policy. So far, most of the paper authors on blended learning are teachers related to network institute, education technology, or basic computer courses, few is working on other majors, such as liberal arts and pure theory subjects. Promoting all teachers' blended learning concept, improving their information literacy, and carrying out blended learning is important, but also a difficult issue. From the perspective of history, the use of technology in education is never easy. Each teacher has formed his own teaching mode and method, if not very necessary, generally they are not willing to spend energy to study the new technology and change the existing teaching habit. In addition, teaching in blended learning style needs teachers to spend more time and energy than traditional classroom instruction , a university teacher' task is heavier and very hard to have enough enthusiasm for implementing blended learning, if there were no related incentive and preferential policy. After years of observation, and research we find that participatory instructional design theory and the particularity of blended learning technology provide some hope for resolving this problem, that is: to promote blended learning activities with students' participation.

2 Possibility and Feasibility of Students' Participation

Implementing blended learning needs network, various information technology tools and modern learning and education technology theory. But most of teachers are familiar with acquiring material through internet, not with multimedia technology, learning management platform or new education technology theory. If teachers could personally use blended learning teaching practice before knowing a lot about it, finish the transition from understanding none to understanding more, from simple operation to complicated mechanism, from having no interest

to having keen interest in the practice process, `it would be in accordance with learning rules, which could become true through students' participation.

2.1 Possibility of Students' Participation

Today's college students, especially those from big cities, growing up in information technology and the network environment, have strong information technology skills. They sometimes are even better than their teachers in some aspect of information technology, and what is more important is that students have strong desire for participating in various things and are easy to accept something new. During many years' teaching on basic computer courses, we found that from the beginning of first semester of freshman, there are some students with stronge ability of using computer, internet, and multimedia technology in evry class. As humans enter the information era, the status of teachers and students has been changed greatly. With the increase of information acquisition methods and speed, the shortening of knowledge renewing cycle, students can learn some knowledge and technology by self-study to acquire specialty in some ways. The relationship between teachers and students is no more only teaching and learning, but learning from each other, so to let the students participate in the teaching design process is much more possible than ever.

Training students to participate in the design and management of blended learning also has its advantage. Every year, each university recruits students, and all the freshmen are needed to learn basic computer courses in their first year. Basic computer course teachers, who undertake a lot of teaching task in large class form, generally have rich teaching experience and pretty strong information literacy, and easier acceptance of the concept of blended learning. At first having basic computer course teachers being trained in blended learning, then basic computer courses are taught in blended learning mode. During teaching process, the teachers select students with high information technology literacy and strong practice ability in their classes and let these students participate in blended learning teaching design and management together with themselves on a voluntary basis, and train these students in theory, technology and precautions of blended learning. Then arrange these students to help teachers teaching other courses implement blended learning next semester. To ensure this project's daily operation and development, a blended learning service association should be built up by education technology experts, experienced teachers and students to organize regular activities, discuss solutions of various problems arising in teaching process and provide further guidance. Since each student studies many courses during the period of university, he/she could assist their teachers in blended learning, forming the cycle development mechanism of assisting teachers' blended learning teaching.

2.2 Possibility of Implementing Blended Learning Successfully

First, implementing blended learning needs a teaching management platform. A complete blended learning platform should be provided with test, teaching materials supply, interactive and collaborative learning function, and so on. In recent

years, many universities have bought their teaching management platform, such as Blackboard, some used free platform, such as Moodle. Except for these large regular platforms, blog, QQ and google cloud, etc. are also used. But generally speaking, when free and self-built platform are used, students have to do more work in helping teachers implement blended learning. No matter what kind of platform is chosen, teachers will meet some difficulties at beginning. But with the experienced students' help, it is easier to construct a blended learning online environment and realize uploading teaching schedule, teaching activities, digital instructional resources, etc.

Second, implementing blended learning needs digital instructional resource. In recent years, a project of national fine-designed, provincial fine-designed and university-level courses construction has been implemented in China and free teaching resources on internet have become more available. These resources could be collected by teachers in person, or by students, then being checked and screened by teachers. Also students could help to finish some other tasks according to teacher' specific requirements.

Third, to assure good study effect, at the beginning of implementing blended learning, all teaching activities maintain original state, just reducing original traditional homework number, but increasing computer aided teaching content, including the network testing, arrangement of discussion topics, interactive and cooperative learning. Teachers can finish the above work with experienced students' help. We have found in teaching practice that students are willing to participate. At this stage, teacher must guarantee enough time of answering students' questions, making students feel teacher's attention ,which does not need a teacher to spent too much of time [4].

Fourth, usually professional teachers don't have enough energy or interest to study some complicated education technology and theory, the key is to create such an learning environment in which most students can enjoy learning the knowledge which is considered important by both teachers and students [5], some successful practice cases of learning being very helpful in this respect. Through studying some cases, teachers could understand various problems arising in teaching, work out related solutions, reduce and gradually eliminate confusion in blended learning teaching and form their own style. There is a project called "Effective Practices Database" in America's Sban - C ("A Consortium of Institutions and Organizations Committed to Quality Online Education "). It works as a platform, collecting and disseminating the network teaching successful cases of American universities (some Chinese web courtyard and local TV university having joined the alliance). China should establish its own "Effective Practices Database", helping teachers improve their network teaching level.

3 Expected Result

First, compared with pure face-to-face teaching and pure online learning, blended learning needs student to spend more time and effort, but it can achieve good effect through reasonable arrangement, particularly to those who participate in blended learning design process. By participating in the teaching process design of

the course which students are studying, students could discuss with teachers and also with other students together, put forward their own proposals, and make their effort for the success of teaching design, which is very beneficial for cultivating students' ability in various aspects [6].

Second, Chinese current university teaching needs to implement blended learning, especially for freshmen. Chinese students being cultivated in exam-oriented education mode, after entering university, are often confused in learning, unsure of what should be done in relatively free environment. They need adequate and timely guidance, so that they are able to become interested in learning as soon as possible and decrease the chance of being affected by bad information and phenomena [7]. The students have strong desire to do some useful things, containing so much wisdom and ability among them, and blended learning teaching can make them receive better guidance, and enhance their learning enthusiasm and exploring spirit.

In addition, "lack of critical spirit" has been considered consistently as the bottlenecks of training top-notch innovative personnel in China. So far, many courses in Chinese universities are still mainly in the style of teacher-centered knowledge impartment, with less group discussion, which causes students to be weak in asking questions and expressing their own opinions [8]. But the interactive learning, collaborative learning, group discussion and homework self-evaluation and mutual evaluation, etc, in blended learning process, need students' independent thinking and judgment, which is helpful to cultivate students' critical spirit in teachers' scientific guidance and avoid some defects of pure online learning [9].

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Empirical Study of Investment Performance Based on Monthly Holding Period: The Evidence from Listed Banks in Shanghai Stock Exchange

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Abstract. When determining the value of a security, we must weigh the relationship between rate of return and its risk. That is, when comparing the rates of return across the securities, we must take into consideration of the corresponding risks. Although so far many models have been developed, Single-factor index model of CAPM often is viewed as the most acceptable one, and the market portfolio is viewed as the benchmark portfolio. After calculating the SML of banking and real yields of banks and comparing them with SML, we come to a conclusion whether the investment performance of banking or its securities are better than that of overall market. The article differ itself from the other studies through evaluating the investment performance based on monthly holding period.

Keywords: A share, Based on monthly holding period, Investment performance assessment, Listed bank, Shanghai Stock Exchange.

1 Introduction

Correctly pricing is meaningful and helpful for professionals to allocate capital in the portfolio efficiently and effectively, to determine what and when to invest in. At the same time, when capital market cannot work well, it can give some advices of policy for administration (Fengjun Liu, 2009). In determining the investment value or evaluating the performance of an asset or portfolio, we should balance the relationship between yield and its corresponding risk. That is, we not only compare rates of return on assets, but also take into consideration of their corresponding risks. In 1952, Harry Markowitz put forth the idea that firm-specific risk can be reduced significantly by increasing numbers of securities in the portfolio. Since firm-specific risk can be removed through portfolio, we can only get reward from systematic risk undertaken rather than firm-specific one. Thereafter, the Capital

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Asset Pricing Model was developed to measure the rational return of symmetric risk by William Sharpe in 1964, by John Lintner in 1965, and by Jan Mossin in 1966 respectively. Because there only exists a market variable in CAPM model, rate of return on market index is often used as the best proxy of rate of return of market portfolio. Although there are a lot of indices in the Chinese capital markets, 000001 (SSE Composite Index) and 399001(SSE Component Index) are viewed as the best proxies in a variety of portfolio indicators, which include as many securities as possible. Performance on a stock and sector can be given by comparing their risk premium with that of market. The paper applies the above principles to the Banking and analyzes the rates of return of 12 banks listed on shanghai stock exchange for the period from October 2007 to December 2010 to judge the overall investment performance of listed banks.

2 Model Designing

I select the single-factor index model of CAPM as the assessment tool in this paper. First, the Beta coefficients of the sample banks are calculated based on sample data, and then we will find the Security Market Line of Banking sector (that is SML_{bank}) by regressing the above Betas. Finally, According to a principle, which in an equilibrium market, individual stock or sector should be on the SML, we judge whether the performance of listed banks is better than that of market individually or as a sector by comparing the rate of return on individual stocks, SML_{bank} with SML.

First, we calculate the Beta coefficients of the sample of bank shares.

$$Beta = \beta_i = \frac{\mathrm{cov}(r_i, r_M)}{{\sigma_M}^2} \tag{1}$$

Second, we get the banking sector' SML_{bank}

$$E(r_i) = \alpha + k\beta_i + \varepsilon_i \tag{2}$$

Finally, SML are compared with the stock returns of individual stocks or the overall investment performance of listed banks as a whole, and then we give some judgments.

3 Data Preparation

As of December 31, 2010, there have been 16 listed banks in China's Shanghai and Shenzhen Stock Exchanges, whose tickers (abbreviation, the listed year and month) are as follows: 000001 (Shenzhen Development Bank A, April 1991), 002142 (Bank of Ningbo, July 2007), 600000 (Shanghai Pudong Development Bank, November 1999), 600015 (Huaxia Bank, September 2003), 600016 (Minsheng Bank, 2000.12), 600036 (China Merchants Bank, April 2002), 601009 (Bank of Nanjing, July 2007), 601166 (Industrial Bank, February 2007), 601169

(Bank of Beijing , September 2007), 601288 (the Agricultural Bank, July 2010), 601328 (Bank of Communications, May 2007), 601398 (Industrial and Commercial Bank, October 2006), 601818 (China Everbright Bank, August 2010), 601939 (Construction Bank, September 2007), 601988 (Bank of China, July 2006), and 601998 (CITIC Bank, April 2007).

Table 1. Descriptive statistics of individual share's yield (or rate of return)

Yield	Min[%]	Max[%]	Mean[%]	Std. Deviat[%]	Beta
Sh000001	-24.63	15.30	-1.13	10.76	1.0000
600000	-34.53	27.00	-0.31	14.89	1.1407
600015	-33.75	27.35	-0.50	13.85	0.4558
600016	-30.40	21.98	-0.95	12.45	0.5755
600036	-31.70	30.92	-0.93	13.44	0.7439
601009	-24.88	26.05	0.10	11.21	0.5160
601166	-32.75	29.33	-0.60	15.47	1.1121
601169	-24.82	30.86	-0.67	13.90	0.4613
601328	-27.75	29.78	-0.91	13.62	0.6352
601398	-20.52	33.95	-0.33	10.89	0.4645
601939	-21.91	33.64	-0.93	11.64	0.8471
601988	-21.63	29.67	-0.79	9.68	0.6202
601998	-26.66	27.38	-1.04	12.55	1.1497
Q-Term rate	0.14	0.28	0.19	0.06	N/A
D-deposit rate	0.03	0.07	0.04	0.01	N/A
Valid N	39				

As a result of shortage of data of bank stock going public in 2010, and there being only two banks listed on Shenzhen Stock Exchange, the paper analyzes the rates of return of 12 banks listed on shanghai stock exchange for the period from October 2007 to December 2010, not including the 601288(ABC Bank) and 601818(China Everbright Bank) going public in July and August 2010 respectively.

All the rates of return are calculated on a monthly basis, and the monthly rate of return is calculated on the basis of the last ex-rights and ex-dividends closing price at the end of each month.

The rate of return for 000001(SSE Composite Index) is used as the proxy of rate of return for market index. Q-Term rate and D-deposit rate are used as the proxies of rate of return for Risk-free rate. Q-Term rate and D-deposit rate denote the monthly interest rate calculated according to the quarterly interest rate and demand deposit interest rate respectively.

As shown in Tab.1, from Oct. in 2007 to Dec. 2010, 12 bank stocks have the lowest monthly yield (rate of return) from -34.53% to -20.52%. In contrast, rate of return over the market is only -24.63%. And the highest rates of return on 12

stocks vary from 21.98% to 33.95%, which are far beyond the 15.30% highest rate of return of market. Differences between Beta coefficients is used to measure the systematic risk of individual stocks from the lowest to the highest are significant, which vary from the lowest 0.4558 (600015, Huaxia Bank) to the highest of 1.1497 (601998, CITIC Bank). In addition to 601166 (Industrial Bank), 600000 (Shanghai Pudong Development Bank), and 601998 (CITIC Bank), the Beta coefficients of the remaining stocks are lower than the market beta coefficient 1.000.

4 Analysis

4.1 Correlations between Beta and Rate of Return

The paper tests the correlation between rate of return and beta coefficients. Table 2 shows we cannot prove that the correlation between rates of return and their betas is significant at the 0.05 level. This suggests that the investment in bank shares, which transacts in the secondary market on basis of the monthly holding period, will not be adjusted in the banking industry to balance rates of return and their risks.

4.2 Comparison of Individual Stock and the SML

As a result of the lack of a strong expected return-beta relationship, we will not attempt to get the banking sector SML_{bank}. We will turn to the comparison between performances on individual stocks with that of the SML. As shown in Fig. 1, return-beta relationship of bank stocks differs from the SML.

Table 2. Test for correlations between beta and yield

Correlations			
		Yield	Beta
Yield	Pearson Correlation	1	-.231
	Sig. (2-tailed)		.470
	N	12	12
Beta	Pearson Correlation	-.231	1
	Sig. (2-tailed)	.470	
	N	12	12

Because there is no corresponding one-month-term interest rate in the market, quarter-term interest rate and demand deposit interest rate are viewed as the best approximates. So I will have two Alphas, that is Alphas and Alpha2, of which one is from the one-month-term interest rate, and the other from the quarter-term interest rate.

After implementing tests on the Alpha and Alpha2 of sample shares, we fall short of finding the difference in sample between individual stocks' Alpha mean and 0. The difference is found between individual stocks' Alpha2 and 0. (As shown in Table 3 and Table 4).

Table 3. Discriptive statistics for the mean of alpha

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Alpha	12	0.0017	0.0171191	0.0049419
Alpha2	12	-0.001717	0.0020022	0.000578

Table 4. Test for the mean of alpha of sample bank

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Alpha	0.344	11	0.737	0.0017	0.0099177	0.012577
Alpha2	-2.97	11	0.013	-0.001717	-0.002989	-0.000445

Table 5. Test for paired sample difference

	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	f	Sig. (2-tailed)
Alpha - Alpha2	-0.0003917	0.000988	0.0001151	-0.000645	-0.0001383	-3.41	1	0.006

Table 6. Test for difference in mean between high and low beta groups

Test Statistics[b]		
	Alpha	Alpha2
Mann-Whitney U	4	0
Wilcoxon W	25	36
Z	-2.242	-2.717
Asymp. Sig. (2-tailed)	0.025	0.007
Exact Sig. [2*(1-tailed Sig.)]	.026[a]	.004[a]

a. Not corrected for ties.
b. Grouping Variable: Catalogue

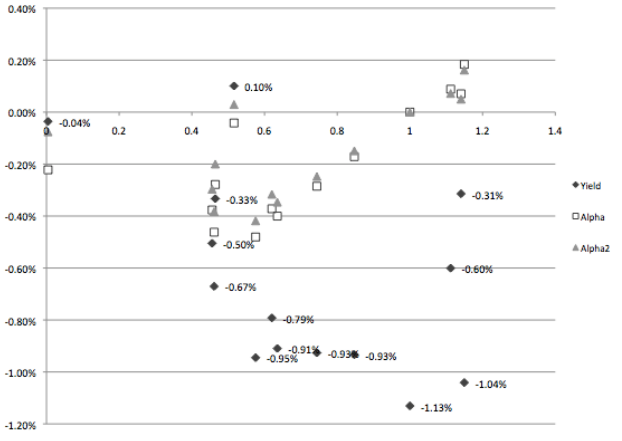

Fig. 1. Scatter Chart of the rates of return of stock and their alphas and alpha2s

In addition to the difference of risk-free rate, sample data is the same. We carry out the test for Paired Sample Alpha and Alpha2, (As shown in Table 5) and the result have proved the Alpha differs from the Alpha2 at the 0.05 level.

As shown in Fig. 1, when the Beta coefficient of bank stock is lower than a certain value 1.0000, Alpha of such share is less than zero. When the Beta coefficient is higher than a certain value 1.0000, Alpha of such stock is greater than zero. According to the critical point (1.0000) of Beta coefficient, we classify the sample into two groups: low beta group and high beta one. We test the two groups, and arrive at a conclusion that although the performance difference between banking sector and the market generally does not testified, there exists the significant difference based on the level of beta coefficients regardless of selection of risk-free rate. The low Beta catalog has performance below the market average, while the high Beta catalog outperforms the market average (As shown in Table 6).

5 Conclusion

5.1 General Conclusion

Based on the above analysis, we find that:

First, In addition to 601166 (Industrial Bank), 600000 (Shanghai Pudong Development Bank), 601998 (CITIC Bank), the Beta coefficients of the remaining stocks are lower than the market 1.000.

Second, after carrying out the correlation test, we cannot prove that a strong correlation exists between rate of return over bank shares and their beta coefficients based on the monthly holding period. It suggests that the investment portfolio, which transacts in the secondary market on the basis of the monthly holding period, will not be adjusted to balance rates of return and their risks across the stocks in the banking.

Finally, whether the performance of banking is better or less than that of the market, it depends on the selection of risk-free rate. When I choose the quarter-term interest rate as the best approximate on the risk-free rate, I cannot test performance of banking sector is inconsistent with that of the market. But When I choose the demand deposit interest rate as the risk-free rate, I can testify that the performance of banking sector is less than that of the market.

Regardless of selection of risk-free rate, I have found that when the Beta coefficient of bank share is lower than a certain value 1.0000, the low Beta group has performance below the market average; When the Beta coefficient is higher than a certain value 1.0000, which outperforms the market average.

5.2 Supplements

First, the above analysis is based on the 12 sample stocks, not including the stocks listed in July and August 2010, which are 601288 (ABC Bank) and 601818 (China Everbright Bank), accounting for 14.29% of the total number of listed banks on Shanghai Stock Exchange.

Second, monthly prices data are only gathered for 39 periods from October of 2007 to December of 2010.

Finally, the analysis focuses only on stock price in the secondary market, without considering such factors as the profitability of individual stocks and sectors and so on. So the conclusions only reflect the relative value of stocks or banking rather than the absolute value of investments.

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Developing Marine-Related Specialities of Higher Vocational College for Serving the Modern Marine Industries

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Abstract. In order to develop the marine economy and foster the competitive marine industries, the State Council gave an official reply to The Plan for developing marine economy of Zhejiang Demonstration Plot. Comparing with the request of the modern marine economy development, the speciality structures of Zhejiang higher vocational colleges have some problems and deficiencies including the marine-related specialities offered weakly, simplex subject, low-quality and kindred structure, limited surperiority, non-charateristic, and awaiting regrouping the education resources. etc. Consequently it needs to give prominence to marine-oriented in the specialities offered, arrange reasonably the marien-related specialities of higher vocational colleges, To optimize personnel-training programs, to strengthen construction of teaching staff and cooperation between colleges and enterprises, and enhance to turn out marine-related talents.

Keywords: Marine economy, Higher vocational college, Specialities.

1 Introduction

Zhejiang province has narrow land area and meager resource, but vast maritime space. It is distinct to develop marine economy in the advantages of the location, resources and industry. Building the system of modern marine industry is an important measure that take their own advantages, accelerating the optimization and upgrading of industrial structure, promoting the transformation of development model from resource-relied to exoteric and innovative, promoting the growth mode from expansive scale to quality and efficiency, to achieve the scientific development, which makes the economic growth build on the bases of structural optimization, resources economy and environment improvement. It is time to promote the development of marine burgeoning industry, marine service industry, port manufacturing industry and modern fishery industry for Zhejiang province after the State Council's official reply to the Plan. The Plan advances definitely that Zhejiang modern marine industries system includes marine burgeoning industry, marine service industry, advanced port manufacturing industry and modern fishery industry.

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2 The Development of Modern Marine Industries Demand Highly Skilled Applied Talents

The Establishment of Modern Marine Industry System in Zhejiang Province. According to classification of economics, the marine industries consist of port transportation, marine equipment manufacturing, marine shipbuilding, marine new materials, marine petrochemical, marine textile, marine mineral industry, marine biological origin, marine fishing, beach tourism, marine service industry. etc. The modern marine industries are in the stage of rapid developing, consummate continually each subcategory and catalyze some new producation categories, just like marine biological origin dividing some new small categories recently.

The marine burgeoning industries consist of marine equipment manufacturing industry, clean energy industry, marine biological origin industry, seawater utilization industry, marine exploration and exploitation industry. etc. The marine service industries consist of maritime financial services, shiping services, maritime trade services, marine information and technology services. The advanced port manufacturing industries consist of shipbuilding industry and other manufacturing industries. The marine fishery industries consist of marine fishery, sea-farming industry, fish and shellfish finely and deeply processed and trade. etc.

3 The Marine-Related Specialities Modern Marine Industries Demand in Zhejiang Province

The main task of vocational education is specializing in the training of the technique-skilled-oriented personnel at the front line of producing and management. Experiences at home and abroad indicate that vocational education is an important mean of improving the overall quality of human resources, and a key supporting of promoting the economy development.

It is said that the rapid rising economy and the promotion of producation quality had intensive relationship with the great development of vocational education, popularization of technique-skilled talents in Germany and Jappen after Second World War. Accordingly the development of modern marine industry request the support of the highly-skilled talents.

The correspondence higher vocational specialities of marine burgeoning industries are biology pharmacy technology, biochemistry pharmacy technology, petrolem refining technology, wind power and dynamic technology. etc. The correspondence higher vocational specialities of marine service industries are port business management, container transportation management, port engineering technology, custom and international freight, port and navigation management, logistic management, navigation technology, international shipping business management, maritime management. etc. The correspondence higher vocational specialities of advanced port manufacturing industries are water transportation, marine machinery engineering technology, ship engineering technology, ship survey, waterway engineering technology, machinery manufacturing and maintenance, ship outfitting, ship electronics engineering, ship electrical engineering

technology. etc. The correspondence higher vocational specialities of modern fishery industry are aquatic product culturial technology, marine fishering technology, integrated fisheries technology. etc.

4 The Status Quo and Deficiency of Marine-Related Specialities Construction of Higher Vocational Colleges in Zhejiang Province

The Status Quo of Marine-related Specialities Construction of Higher Vocational Colleges. There are ten higher voctional colleges those have marine-related specialities like Zhejiang Institute of Communications, Zhejiang International Maritime College, Zhejiang Technical Institute of Economics, Jinhua Polytechnic College, Zhejiang Business Technology Institute, Huzhou Vocational and Technical College, Ningbo City College of Vocational and Technical, Jiaxing Vocational and Technical College, Zhejiang Changzheng Vocational and Technical College, Jiaxing Nanyang Institute of Vocationa and Technical. In recent years, the amount of students in these colleges has been increasing year after year. The numbers of new entrants and enrolled students of Zhejiang marine-related higher vocational colleges are 402 and 1200 respectively in 2003, 971 and 2200 in 2005, 2309 and 6598 in 2010. Comparing with the numbers in 2003, the numbers in 2010 grow by 4.74 times and 4.49 times respectively. For example of Zhejiang Institute of Communications, the specialities of marine engineering technology is provincial higher vocational characteristics professional, the speciality of navigation technology is the professional of national higher vocattional teaching reform pilot. Both these two specialities of Zhejiang International Maritime College are provincial higher vocational characteristics professional.

5 The Deficiency of Marine-Related Specialities Construction of Higher Vocational Colleges

The first is that the amount of enrolment in marine vocational colleges is not much. The statistical enrolment data from 10 marine-related vocational colleges shows that 13 specialities accepted 2309 students which contained biological origin technology, port business management, container transportation management, port engineering technology, custom and international freight, logistic management, navigation technology, international shipping business management, marine machinery egineering technology, ship egineering technology, machinery manufacturing and maintenance, ship outfitting, ship electric eginering technology. The second is that the range of established marine-related specialities is not wide. The statistical enrolment data from 10 marine-related vocational colleges also shows that there are merely 13 maritime specialities, 8 higher vocational colleges have barely 1or 2 maritime specialities except Zhejiang Institute of Communications and Zhejiang International Maritime College. The correspondence specialities of marine burgeoning industry and modern fishery industry are barely scarce. The

last is that the distribution of specialities is irrational. From the location of these 10 marine-related higher vocational colleges, it is told that there are 4 colleges in Hangzhou, 2 colleges in Jiaxing, a college in Ningbo, Zhoushan, Jinhua, Huzhou respectively. The Plan advanced definitely that it would be strengthen in the fields of marine basic research, science and technological research, commercialization of achievements and personnel training of three great coastal metropolitan cicles including Hangzhou, Ningbo and Wenzhou. Actually, there is merely one marine-related vocational college in Ningbo and none in Wenzhou.

6 The Countermeasures of Developing Maritime Higher Vocational Specialities

Changing the Ideology, the Establishment of Higher Vocational Should Be Oriented to Marine Economy. It is an important deployment made by the CPC of Zhejiang committee and the government of Zhejiang from the overall and strategic view which contains developing marine economy energetically, empoldering marine resources scientifically, culturing the advanced marine industry, building marine economy of demonstration plot, and this stategic deployment points out the direction for higher vocational colleges of Zhejiang. All higher vocational colleges should carry out and fullfill the Plan deeply, change the ideology, renew the concept, plan scientifically, develop integrally, extrude the marine-economy-oriented, aim to the overall development pattern which is “one core, two wings, three circles, nine districts and more islands” of Zhejiang marine economy, and develop energetically the maritime higher vocational specialities, especially for the higher vocational colleges of Hangzhou, Ningbo and Wenzhou.

7 Strengthen Coordinating to Be the Reasonable Layout of Higher Vocational Groups of Maritime Specialities

In accordence with the request of functional layout, industrial chain link, post demand and separate development. These higher vocational colleges in the demonstration plot should fix position scientifically and reasonably, concentrate the advanced resources, take advantage of comparative advantages and build and strengthen the higher vocational groups of marine specialities in order to improve the core capacity of competition and adaptability of personnel training. It is time to make the single marine speciality to be groups of specialities for marine-related higher vocational colleges. The vocational colleges of Ningbo should develop energetically the correspondence higher vocational specialities of marine burgeoning industries, the correspondence specilalities of modern fishery for Zhoushan, and some marine-related higher vocational specialities for Wenzhou.

8 Optimizing the Scheme of Personnel Training, Improving Social Competition

We should build the solid communicating course system consisting of public basic course, required course, specialized module course or "the directional module courses" and optimize the scheme of personnel training in accordance with the demand of modern marine industries to the talents. It can be realized that culturing several kinds of talents in the same speciality in the establishing of specialized module course. It also can be realized directly to join the course system to the modern marine industry and enhance the students' specialized ability and improve the social competition in the "directional course module". It is needed that we should establish the diversified personnel training modules from the employment-oriented and combine the general education and specialized education. We should push the establishment of associated cultivation mechanism, which is between the scientific base of enterprises, campus and research and enterprises and government institations and build the associated cultivation mechanism that exchange the teachers and students in different higher vocational colleges, admit credits and open classroom each other.

9 Enhance the Teaching Staff in Order to Provide the Intellectual Support for Personnel Training

It should establish flexible mechanism of teaching staff construction, enhance muti-channelly the marine-related teaching staff, through the way of engaging, introducing and cultivating. We must accelerate the introducing and cultivating, further expand the marine-related talent parade, improve the ability of undertaking research projects, give the intellectual support for marine personnel training by "The Program for New Century Excellent Talents " of The Minstry of Education, "The Program to Introduce Overseas High-level Talents" and "Distinguished Professors of Qianjiang Scholars " of Zhejiang province.

10 Potentiating the Cooperation with Enterprises for Cultivating Higher Vocational Skilled Talents

The most distinguishing feature of vocational education is that has a closed cooperation with business and it cultivates the talents in accordance with market request. Higher vocational colleges should carry out preferential policies, smooth away the pathway between colleges and business. The government must evolve the concrete policies especially in the preferential policies of businesses' tax revenue, encourage the businesses to give the investment to colleges and make the rights, obligations and responsibilities of cooperate parties between colleges and business to be explicit. Businesses can enjoy related preferential policies whatever these investments and donations to the colleges. For higher vocational colleges, they should propel actively the colleges to serve the marine economy, to push the

combining work and study, guide colleges to step out to run colleges. The government should also support the vocational college to have the cooperation with marine-related businesses, accomplish the associated college-operating for cultivating higher vocational skilled marine-related talents.

11 To Strengthen Cooperation among Enterprises/ to Strengthen Cooperation between Colleges and Enterprises and to Train Vocational Skilled Personnel Related to the Sea

The biggest characteristic of vocational education is its close cooperation with enterprises, training personnel to meet the market. Colleges are supposed to implement preferential policies and figure out the cooepration channel to enterprises. Government should issue specific policies, particularly those of tax incentives, to encourage enterprises to invest on education and ensure rights, obligations and responsibilities of both parts. Any company that makes investment on education can enjoy corresponding preferential policies. Higher vocational colleges are supposed to take the initiative to encourage students to work for marine economy and guarantee the channel between colleges and enterprises so that vocational colleges can keep a foothold in the society. We are supposed to support the cooperation between colleges and marine industry, so as to promote joint-education and train skilled personnel in marine field.

12 Conclusions

In short, vocational education is an important way to improve the overall quality of human resources and an important support for economic development. In a time when great efforts made to develop marine economy, the construction of vocational marine expertise should be strengthened in college. As for the major setting, the courses should be properly constructed, namely, marine economy-oriented so that personnel training programs are optimized, and construction of teaching staff and cooperation between colleges and enterprises are strengthened. Consequently, the training of professional personnel in marine field is promoted.

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Mechanical Principle Teaching and Engineering Ability Training

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Abstract. Developing teaching of Mechanical principle on the basis of innovative thinking and engineering practice ability training is a need of training engineering students under new situation. In the paper the requirements of this training object to teach Mechanical principle is described, some constraints of current teaching system is analyzed, including that course system is dated, teaching method emphasizes on imparting knowledge, and knowledge directional exams are not conducive to engineering ability training, most experiments fail to achieve the purpose of training engineering ability, etc. And then, how to cultivate students' innovative thinking and project practice ability is discussed, and suggest that teaching method, experiment, examination mode, curriculum design, class discussion and other aspects need to be certain reform and innovation. Engineering ability training is a systemic process and needs persistent efforts in all aspects.

Keywords: Mechanical principle, Teaching, Engineering Ability.

Introduction

To meet the requirements of scientific and technological development to high-quality personnel, training the students' innovative thinking and engineering practice ability has been an important object of engineering college education of colleges and universities. As an important basic course of technology, *Mechanical principle* plays the role of linking between past and future in the whole academic programs; It not only includes abundant basic theory and some engineering knowledge, but also includes a series of unique methods using basic theory solve practical problems. During *Mechanical principle* teaching need to closely contact with practice, constantly enhance its analysis and research ability to the structure and machine to lay the foundation for its training of innovative thinking and engineering practice ability.

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1 Requirements of Innovative Thinking and Engineering Ability to *Mechanical Principle* Teaching

'The scientists study the existing world and engineers create a new world', this famous saying reveals that the nature of engineering is application, practice and innovation. For engineering students entering into engineer industry, the professional knowledge is important, but more important is the professional ability transformed by professional knowledge, and is the ability of analyzing and solving practical engineering problems by synthetically using professional knowledge and skills[1].

Innovative thinking and engineering practice training of students is a systematic project. CDIO educational philosophy divides this project into four levels of basic knowledge, personal skills, interpersonal team ability and engineering system ability, emphasizes that let students learn engineering by ways of initiative, practical and organic link between courses.

Mechanical principle is important part of first level of this system, and is main basis knowledeg required by training students' innovative and engineering ability. This course should make mechanism design as the main line and make introduce various common machanisms' application and design as core contents, profoundly reveal machanism design principles and internal relations and laws of various machanisms; Let students learn common analysis integrated methods on the basis of mastering baisc theory of mechanism, basic knowledge and skills, have the initial ability of developing mechanical system operation program analysis and design to lay good foundation for training students' design and innovative ability[2,3].

2 Current Constraints

At present, there are these factors restricting students' innovative and engineering ability training during *Mechanical principle* teaching, including:

2.1 Knowledge System Is Dated

Current *Mechanical principle* course system is introduced from former Soviet Union in the fifties of last century, though has been carried out a number of reform, but overall it still belongs to the old system and content.

Such as the mechanism's analysis and design methods of course, they follow the tradition of the former Soviet Union and has been using graphical method. However, with the development of science and technology informatization and computer, this method hasn't gradually met high-speed and high-precision requirements during mechanism design and analysis process, and its basic place has been gradually replaced by analytic method. But at present, during most of teaching, still remain graphical method as the main method to teach. There are three main reasons, first, the graphical method is more intuitive than analytic method and the students are easy to understand; Second, the weakness of low precision

has not been a problem on the basis of AUTOCAD and other computer software; Third, the graphical method is convenient for question paper exam[4].

2.2 Teaching Method Emphasizes on Imparting Knowledge

At present, during teaching process of *Mechanical principle*, more attention is to import knowledge points and master knowledge, the teaching activities are mainly lectures in classroom, from books to work, from virtual model to experiment or design reports. During learning, the students lack training to actual product design, analysis and key technology's extraction ability, which cause their abilities of rearching and solving problem be poor, when facing to real problems they ofen follow like sheep and not confident.

2.3 Knowledge Directional Exams Are Not Conducive to Engineering Ability Training

Exam is the baton of teaching, the contents and ways of exam directly affect the students' learning. Now, the exam of *Mechanical principle* commonly uses single question paper exam and the closed book examination based. Exam contents present teaching materials and intellectualization, key experiment is the students' memory and understanding to knowledge, but neglecting to review their practical ability, verbal ability and innovative thinking ability, etc. should be trained by the courses.

The results caused by using this biased and representative question paper exam are as follows:① The students also only focus on exam score rather than themselves comprehensive abilities improvement, and lack initiative and creativity of learning; ② In order to get higher score, the students learn books' knowledge by rote rather than pay attention to their own knowledge horizons. ③ The students accustom to accept the existed knowledge conclusions but lack innovative and practical ability, lack the ability of using knowledge analyze and solve problems.

2.4 Most Experiments Fail to Achieve the Purpose of Training Engineering Ability

At present, most experiments of *Mechanical principle* are demonstration and validation experiments, their main purpose is to validate, consolidate and deepen the contents of theory teaching rather than training students' practical and innovation ability; Besides, the contents of all experiment items basically are isolated and have not formed a complete experiment system; The experiments require students to complete strictly according to experiment instruction, so everyone's experiment method, steps and data's processing and result are almost same, which provides opportunity for students each other copy experiment data and makes itself lack attraction, restricts the students innovative ability training and affects experiment results.

3 Measures to Train Engineering Ability

3.1 Adopt Various Teaching Methods to Motivate Students' Innovative Thinking

Training innovative thinking is a major part during training students engineering ability, during teaching process, can stimulate students' innovative thinking by various teaching methods.

1) Stimulation method. During teaching can ask many questions to stimulate students think to induce innovative thinking. For example ratchet mechanism part, can ask the question after teaching one-way drive ratchet mechanism: how to improve one-way ratchet mechanism to two-way drive ratchet mechanism (such as the feed mechanism of shaper)? After some thought to students, continue to teach two kinds of two-way drive ratchet mechanisms. Then, again ask the question: how to meet the variable requirements of ratchet stepping angle during practical production? After some thought to students tell them two kinds of ratchet mechanisms of stepping angle variable. Like this, change teaching process to the process of continuing to ask questions, solving questions and then asking new questions.

2) Guidance method. Before teaching some theories, can introduce them by some popular and easy-to-understand examples, thereby leaving a deep impression for students. E.g. relative motion principle is a very important theory, when teaching can introduce it by the watch. In the watch, second hand, minute hand and hour hand form a physical system, three parties do relative motion with fixed gear ratio. Why the relative motion of three hands not change when the people putting on the watch and moving? After this example the students will have a deeper impression when teaching relative motion principle.

3.2 Reform Experiment Teaching Parts

1) Increase the proportion of comprehensive and designed experiments. Comprehensive and designed experiments can more stimulate students' passion of bold innovation and brave exploration, improve their abilities of practice, comprehensive analysis and solving practical problems. In recent years, on the basis of original four experiments (planar mechanism movement diagram mapping, gear generating principle, gear parameters determination and rigid rotor dynamic balance), our college adds mechanical motion analysis and structure design comprehensive, mechanism drive system innovative design 2 comprehensive and designed experiments. Of which, mechanism drive system innovative design is the experiment of design innovation, during the experiment, the students can use mechanism create and combinate experiment table to conveniently realize their own ideas, and perform preliminary performance verification. The experiment will stimulate students' experiment interest and train their ability of comprehensively using theory knowledge and innovative ability.

2) Change experiment and teaching methods. Change traditional experiment model of experiment teacher designing plan and arranging experiment steps, students only observing the phenomenon and recording data, replaced by new

method of training ability as main line. For comprehensive and designed experiments perform open system to provide relaxed learning environment, fully play their initiative and creativity, put experiment teachers' main energy on guidance, supervision and inspection, improve students' learning initiative and curiosity and train their innovative abilities and innovatve awareness.

3) Reform experiment result evaluation methods. Change the previous method of only according to experiment report to evaluate experiment result, experiment result should be evaluated combining with experimennnt operation ability, experiment preparation, experiment report, experiment attitude, etc. This method of comprehensively evaluating experiment result enhances students' self-consciousness and responsibility for experiment and conducive to realize scientific and strict experiment process management.

3.3 Reform Assessment Methods

Change course exam from focusing on knowledge review to focusing on ability review.

1) For exam contents, make the exam contents of having practical features, beyond textbook openness as important means of promoting students practice training and training their engineering ability. Guide students flexibly learn and use and more master knowledge during using, more find and make up the shortfall; Encourage students brave to practise and fully play and show their abilities.

2) For exam ways, break the shackles of traditional question paper exam, and around students' innovative and engineering practice, etc. abilities, flexibly use open exam ways. For example require students complete design, produce, participate in science and technology competition and scientific research projects, etc; or synthesize various exam ways use, such as written+ practical operation+ reply and so on.

3) For exam evaluation, consider from stimulating students' initiative and innovation, attach importance to students' independent thinking and creativity and provide free space for students playing initiative and internal potential.

3.4 Strengthen Exercises Discussion Part

This course's learning content, method and requirement are different from previous course, the customary methods of rote memorization and applying formula are completely inappropriate. Exercises discussion is to do exercises combining with typical topics with main method of discussion. Teachers will generalize and sort out according to the problems exposed in learning of students, and let students answer by the form of question, and give the problems to students for each other discuss. By exercises discussion can guide students positive thinking, active analysis and develop thinking to train students' abilities of drawing inferences about other cases from one instance and comprehending by analogy.

3.5 Strengthen Course Design Part

Course design is a most important part of this course teaching. By course design the students not only can consolidate and comprehensively use learnt theory knowledge, but also can accept initial training of determined movement program, improve the abilities of using technical information, computing, mapping and computer application. Course design should be based to develop students intelligence, emphasize movement program determination of mechanical system, mechanical movement program design is the critical part of whole design process on training students creative design ability and independent work ability, it comprehensively and organic uses various mechanisms isolated from each other learnt from teaching to specific design according to their different features and application situation, fundamentally train and exercise students' abilities of comprehensively considering design problems from global view.

4 Conclusion

Based on training creative thinking and engineering practice ability to develop teaching of *Mechanical principle*, making classroom teaching, innovative theory and practice organic combination can better mobilize students' learning initiative and creativity, improve their abilities of analyzing and solving problems. The current teaching models of *Mechanical principle* have some factors not meeting with this training object, can reform and innovate on teaching methods, experiment part, exam ways, course design and discussion part, etc. to solve them. Talent cultivation is a systemic and long-term process and needs persistent efforts in all aspects.

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Exploration on Cultivating Integration Capabilities of Polymer Talents

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Abstract. For cultivation and improvement of the talents with integration capability and innovative consciousness in the field of polymer science and engineering, we analyzed the current state of the curriculum establish and the teaching methods, teaching contents, and teaching means. We firstly brought out our definite cultivation objectives on the education reformation. Then, we put emphasis on the curriculum establish and suggested to setup three kinds of curriculums such as basic courses, specialized courses, and optional courses to broaden the knowledge of the students. Moreover, the research and practical teaching models were introduced into our curriculums for training the students' knowledge from the theory to practice. Some great achievements such as rapid growth of top students, high enrollment rate of postgraduate students, and high employment rate of undergraduate students were obtained through the reformations.

Keywords: Curriculum reformation, Innovative consciousness, Research teaching, Professional practice.

1 Introduction

Polymer material is one of new materials with the fastest developments, the widest applications, and the longest viabilities. Some relevant material industries are developed rapidly, and need a large number of professional talents. Thus, polymer science was classified as one of the most important branch of material sciences in many colleges. Since the conceptualizations of some courses in the polymer science and engineering are more abstract, it is very complicated and difficult for polymer teaching and cultivating professional talents. In order to improve the education quality of the polymer science and engineering, we attempt to analyze and investigate the current state of the curriculum teaching, including the development trend of the polymer sciences, the curriculum establish, the reformation of teaching methods, the update of the teaching contents, the development and application of the specific experiments, and so on. Then, we bring out our cultivation objectives and some upswing plans based on learning and summing up the advanced experiences from home and abroad.

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2 Cultivation Objectives

Definite cultivation objective, and standard, scientifically reasonable teaching content and method are the key points to ensure the high cultivation quality of the talents. We defined the cultivation objectives to emphasize on the integration capabilities and innovative consciousnesses of students, according to analysis and investigation of their ideals, skills, abilities, and enterprise requirements. The detailed objectives are focused on the cultivation of the applied technology talents for enterprises and the research talents for academic and research institutes. Moreover, the students, who have the leisure time and interests, are encouraged to study economy and management program as their second majors for developing the administrative talents. Therefore, the curriculum establish should manifest the principle of science, prospect, rationality, and maneuverability.

3 Curriculum Setup

The curriculums of the polymer science and engineering contain lots of scientific experiments and engineering practices besides the theory classes. In order to cultivate the talents who can operate and apply theories to practice, we setup the curriculum system including the theory classes on the characteristics of polymer science and engineering and lots of experiments on the synthesis and processing characteristic of polymer materials, based on the experiences from the domestic and foreign universities. Three kinds of curriculums such as basic courses, specialized courses, and optional courses had been setup.

Basic courses are the fundament of the technological courses, including polymer chemistry, polymer physics, and processing of polymer material, etc. From the basic courses, the students master the basic knowledge of polymer material, consolidate the engineering awareness, bridge between the basic theory and engineering technology, and cultivate the elementary application ability. The goal of specialized courses is all-around to cultivate the academic and engineering talents by learning engineering technology theory, consolidating engineering training, and mastering engineering practice and science research method. Optional courses of polymer science introduce the development trend of technological service fields, such as functional polymer materials, composite materials, and coating chemistry. Thus, optional courses make the students master the cutting-edge research method and the comprehensive abilities.

For enhancement of the experiment skills of the students, the theory leaning time was shortened and experiment period was extended. Besides basic experiments in polymer chemistry, polymer physical, and polymer processing, essential practical trains such as mold design, reference reading, polymer comprehensive experiment, are setup in the experiment period.

4 Teaching Reformations

Class teaching reformation plays a key role to train the high-quality professional talents because it is the main teaching way in college education. Some reformations were carried out in class teaching, including not only textbook, curriculum setup, lecture preparing, and course practice process, but also communication and exchange of the international education among the other universities, open education setup, research education, and modern teaching method reformation. In order to improve the students' practices abilities, the period of the research experiments and engineering designs in practice process had been increased.

4.1 Using Modern Device in Specialized Course Teaching to Bring Up and Excite the Students' Learning Interest

Although the polymer materials are closely related to our lives, rare students had seen fabricated equipments and technique in deed. Most students had no ideas about contents initiated in classroom. Therefore, inputting the models of the knowledge and equipment into computer by using multimedia technology and software, students have well understood the specialized courses in classroom teaching, because 3D animation can make the pictures active. Thus, students have learned the operation processing of equipments through the simulation of production fabricating. The various teaching method not only make the students understand specialized course easily, but also bring up and excite their learning interest. In addition, students can well understand the advanced development of equipment and play their imagination and innovation ability by showing the multimedia teaching in class.

4.2 Introduced the Research Teaching to Inspire Students' Learning Initiatives

In order to learn advanced teaching experiences, we try to introduce the research parts in classroom teaching, some courses such as functional polymer material and polymer auxiliary are proposed in class teaching. Then, students are required to complete a research report independently on the basis of summarizing references and market investigation. Finally, students present and discuss their research results by multimedia. This teaching method greatly stimulated students' enthusiasms. Moreover, the abilities of students' autonomic learning have been improved, and the comprehensive abilities of students' integrating theory with practice have been also all-round improved by information collecting, data processing, summarizing, expression written, and oral presentation skills.

4.3 Strengthen the Practice to Improve Students' Innovation Abilities

Besides basic experiments such as polymer chemistry and polymer physical, mould design and literature search are established in professional practice. Moreover, 2 weeks of polymer science comprehensive experiments as the especial research experiment are added to the experiment training. Under the teacher's guidance, students complete literature searching, materials and instruments preparing, experiment designing, synthesizing, and characterization by themselves. During the experiments, students are required to join the modification of the experiment manuscripts in order to increase the learning initiative, which is learned from Japan. Presentation and discussion are preformed after the experiments. The abilities of literature search, independent think, and analysis and solving problems are trained in the experiment process. Moreover, the students' teamwork spirits are improved.

All junior students who have leisure time and interest are encouraged and welcomed to enter the lab early. Then, under the tutor's guidance, these students' scientific abilities such as the major implications and research unfolds are trained in their early research lives.

5 Construction of a High-Quality Team of the Teachers

To improve teaching qualities and cultivate innovative talents, a high-quality team of teachers is necessary. Now, it is the time to reinforce international competitiveness. We are constantly expanding the construction of the teaching team for improving the teaching quality and intensifying the school teaching management.

Several professional teachers with doctorates have joined in the department of polymer science and engineering in our university. The overall level of the teaching and science research are greatly improved with their participation. Moreover, the teachers are from different institutions with various research backgrounds, which provide a good basis for the interdisciplinary research. Those teachers without doctorates are encouraged to study doctoral course part-time to improve their education levels and comprehensive abilities. A young, energetic, and competent teaching and science research team is formed by the construction of the teaching team. They work cooperation and clear division of labor, complementary advantage, solidarity, and progress.

To improve the teaching and research capabilities of the teachers, they are encouraged to go to the other famous universities at home and abroad as visiting scholars to study the teaching experiences and exploring abilities of research. Moreover, the foreign polymer professors are invited to give the lectures in our department, and the professors from famous universities and institutions are named as Honorary Professor for guiding teaching and research work to the young teachers and students.

6 Students Participate the Teaching Reformation

Discussions and communication about how to live well in college and learn in a suitable method with the freshmen students are hold every year when they enter university. The students are encouraged to bring out their own options of the teaching reformation to let the students participate in the teaching reformation and helping us to find the most suitable methods in the class and practical teaching.

7 Achievements through Reformations

7.1 Top Students Grew Rapidly

A number of students entered different laboratories early before their senior learning classes. These students have chances to take part in the teachers' research projects and obtain some excellent results. For example, a student entered a lab in his junior class. He was awarded as International Polymer Researcher on the conference of IUPAC in 2001 for his wonderful presentation and interesting results in his research. An undergraduate student published more than ten research articles on the journals with high quality. Moreover, some students obtain the first or third prizes of the challenge cup at national level.

7.2 A Great Breakthrough on Quantity and Quality of Postgraduate Study

About 80% students have passed the postgraduate entrance examination among the joined students. Moreover, many students were permitted to the famous universities and institutions such as Chinese Academy of Sciences, Fudan and Zhejiang University.

7.3 Employment Rate Achieve 100%

Employment rate of students in our department was very high and achieved 100% during these years. The students mastered good technological and science research abilities are welcomed and employed by many enterprises.

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Application of Eight Engineering Education Management Principles in the Application — Oriented Talents Training

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Abstract. The key purpose of engineering education is to train qualified engineers and qualified engineers. They should have capability of life-long learning, good communication skills, problem solving skills and social adaptability. The main viewpoint of eight principles of engineering education include: student focus, teachers role, academic freedom, realistic teaching environment, emphasis on humanistic spirit, continuous improvement, respect for differences, openness and sharing of resources. It is the core idea of engineering education based on ISO9000 standards. The tutorial system presented higher demand for teachers; teacher's function is students' "mentor" and not simply teaching. The credit system laid the foundation for the ability to lifelong learning of students. Professional accreditation required colleges and universities reform teaching methods on to train qualified applied talents. Eight management principles of engineering education is the foundation in personnel training to achieve engineering education.

Keywords: Engineering Education, management principles, applied talents training, ISO9000.

1 Introduction

American higher education focused on skills and creative ability, pay attention to personal character development. In the end of 1990s Massachusetts Institute of Technology and the Swedish Royal Institute of Technology and other universities set up a joint international research cooperation organization, set up engineering education concept of "Conceive- Design-Implement-Operate ". Established a modern engineering education model, the model of CDIO award the 2011 highest engineering profession in the U.S.. British higher education system transformation towards the application in recent years, most institutions courses have strong practical, many courses includes practice to help students gain valuable work experience.

There is a large gap between students of China's higher education trained and the developed countries in innovation and analysis of problems and problem-solving ability and social adaptive capacity. At present, many institutions are carrying out engineering education reform, Shantou University as the China's first

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institutions to join CDIO international cooperative organizations, proposed EIP-CDIO (professional ethics, integrity and professional ethics and the idea of CDIO) training pattern. To enhance the quality of engineering education, "excellent engineer education training program" was included in the "long-term education reform and the National Development Plan (2010-2020)" by the Chinese Ministry of Education and approved Tsinghua University and other universities as the university of practicing " the plan of excellent education and training of engineers ", to reform the engineering personnel training objectives, standards, teachers, training modes, teaching methods and contents.

Engineering education is the main channel to provide engineering and technical personnel, one of the goals of engineering education is to train qualified engineers. Innovate engineering talents training, train talents combination with wide scope, expert and cross subject talents. [1] Qualified engineer should have the ability and habit of lifelong learning, to competent and meet the changing career needs; have good communication and collaboration skills, to meet the team work and interdisciplinary cooperation needs; to determine and solve engineering problems correctly; understand the complex relationship between engineering and society.

2 The Main Ideas of Eight Principles of Management of Engineering Education

ISO9000 standards are common now quality management and many universities abroad have passed ISO9000 certification. TC176 Technical Committee concluded that the quality management experiences, and absorbs the international quality management experts, identified the eight quality management principles of ISO9000 standards. These principles are the theoretical basis of quality management. The main contents include: Customer focus; leadership; Involvement of people; process approach; System approach to management; continual improvement; factual approach to decision making; mutually beneficial supplier relationships. The purpose of the ISO9000 quality management thinking applied to higher education is to show that the organizations (universities) could meet customer requirement on quality of personnel training and obtain students and their parents and social enough trust.

The main content of eight management principles of engineering education: [2]

Students focus: Teaching resources should meet the different needs of personnel training and provide students with flexible education process and pattern. Teachers role: Engineering experience is the first condition to recruit and promote, the teacher should have a diverse educational background. Academic freedom: Advocate teaching freedom, learning freedom, academic freedom is the fundamental of university, open and free academic environment, will attract and nurture a good scholar. Realistic teaching environment: Engineering sites, simulation scenarios and public laboratory as the primary learning environment. Emphasis on humanistic spirit: Engineering education must be based on science and technology, including social, economic, cultural, moral and environmental improvement on many factors. Continuous improvement: Implement professional certification

and introduce a third institution examine the whole process of education and evaluation to achieve continuous improvement. Respect for differences: Take into account differences of individual and family and economic and social environment, different culture when training. Openness and sharing of resources: Through interschool, school-enterprise, international cooperation and exchange to achieve educational resources sharing.

Eight Principles of engineering education requires we change concepts and reform teaching methods, focusing on the practical ability of students and lifelong learning abilities. The students should be developed into a strong sense of social responsibility, honest, hard and rigorous, professional dedication, innovative spirit, with a complete personality, higher cultivation, extensive knowledge, and useful talents for social development. The application of the eight principles of engineering education on the current has great practical significance for deepening teaching reform, improving the quality of teaching and cultivating innovative talents.

3 Application of Eight Management Principles of Engineering Education in the Application- Oriented Talents Training

Application of eight management principles of engineering education in the process of applied personnel training is mainly reflected in the tutorial system, Credit system and professional certification system.

3.1 The Tutorial System

After students complete their basic general education courses, they select mentors according to their professional development and their interest. The professional background, engineering experience is a basis for students to choose. Tutorial system requires teachers to have a solid theoretical foundation, a wealth of practical experience and also have capacity for scientific research and services for the community. It has a positive effect to the construction of teacher teams. Tutor should be registered by national and is the example in the minds of students. Tutor Instruct students learning, practical ability and scientific research ability based on students' interest and expertise, guide and improve students in career planning development.

In virtue of school-enterprise platform, tutors teach students engineering experience. It is essential way to train science and technology of engineering talents through universities and industry cooperation. Personnel training needed appropriate practice places as teaching and learning environment for teaching provided by the enterprise. Strengthen collaboration of colleges and enterprises; build engineering training platform is an important part to improve the practical ability of students.

The tutorial system shows principles of the process of students focus, teachers' role, academic freedom, pay attention to the cultivation of the humanism. Teachers are important element of "the current system" in engineering education. It is a

useful complement to enhance the innovative ability, develop high-quality personnel and improve teaching quality. [3]

3.2 Credit System

The core of credit system is to establish a scientific selecting course; in the system students as "customer". Under the guidance of tutor according to principle of student-centered granted students select course rights. Engineering education should emphasize cultivation of human spirit; the future Engineers should learn literature, philosophy, music and art to meet the career development and individual needs. Integrated development of students as the goal, respect for individuality, teach students in accordance with their aptitude. Break the professional, department and faculty, allowing students to select course and learn cross professional and across faculties. Students select course according to their ability and career planning, obtain a diploma through oral defense after complete basic courses, professional courses, optional courses and practice courses they have selected within the framework of schools required. Implement credit system lead to the period varies with different individuals, and become the basis of implement flexible curriculum. [4]

Credit system reflects the principles of students focus, academic freedom, Emphasize humanistic spirit, respect for differences, openness and sharing of resources.

3.3 Professional Certification System

Reform the traditional examination system is the precondition of implement professional accreditation system. Appraisal system should reflect the evaluation of ability of process-based assessment and practice of capacity assessment. Capacity for innovation is crucial to the reflected in engineering education, include at least in four areas: thinking ability, practical ability, communication skills and learning abilities. We should carried out reasonable and effective assessment methods for students and break the original relatively simple mode of examination,

Carry out many examine forms, such as students presents, summary, self-evaluate and evaluate each other and so on. [5] Professional certification system is an important part of the process of continuous improvement training talents. Continuous improvement of quality management is the eternal goal in all areas. A third party conduct periodic evaluation of management activities, identify potential factor for improvement, enhance management efficiency and effectiveness to achieve incremental improvements. PDCA cycle include Plan- Do- Check- Act four phases, is the primary means of continuous improvement, PDCA cycle management model reflects the scientific management tools and work procedures. Figure 1 shows PDCA cycle in the management process of engineering education.

Introduction of third professional institution evaluate the whole process of engineering, is key means to ensure quality of engineering education.

Professional certification system reflects the principles as fellows: students focus, continuous improvement, teachers role, realistic teaching environment, emphasis on humanistic spirit, respect for differences, openness and sharing of resource.

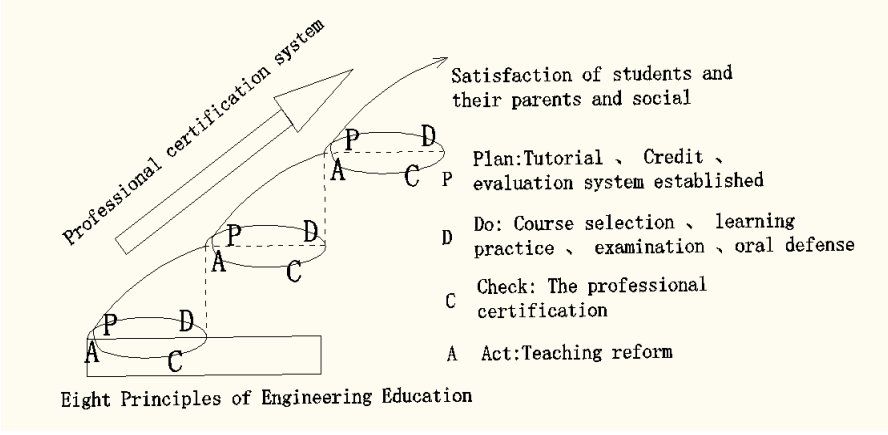

Fig. 1. The PDCA cycle management of engineering education

4 Conclusions

Carry out the tutorial system, credit System and professional certification system is the application of the eight principles of engineering education, which based on ISO9000 standard applied to engineering education process, as the carrier of projects close to engineering technology, economic, business and community, So that students improved their skills and ability constantly in theory, innovation, collaboration, communication and other aspects of engineering systems. In the end achieve the goals training and education for the engineering talent.

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Study on the Design and Implementation of Economics Experiment—Take Demand Curve as an Example

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Abstract. It has long been considered that economics can not be taught by similar chemical or physical experiment. In most universities, economics is taught in the traditional method. Teachers talk while students listen passively for examination. Because students' autonomy, initiative and creativity are ignored, it is not easy to train qualified economics talents. In order to improve teaching quality and train qualified economics talents, it is necessary for teachers to design and implement economics experiment widely. Thus teachers not only can enhance students' enthusiasm and initiative but also can develop their potential and individuality. In this paper, how to design and implement economics experiment is illustrated by taking demand curve experiment as an example. The deviation of experiment and reality is finally analyzed. For real economy is very complex, it is difficult to design experiment completely consistent with reality and there are differences between experiment and real economy.

Keywords: Economics, Economics Experiment, Design and Implementation.

1 Introduction

Economics has long been considered not easy to be taught by experiment. In 1962, Vernon Smith published a paper *Experimental Study of Competitive Market Behavior*. This paper is considered a sign of the birth of experimental economics. Since then many American universities have done economics experiment for long time [1]. In 1994, Renmin University of China established the first economics laboratory in China. Subsequently Nankai University, Beijing University and some other Chinese well-known universities have also established economics laboratory.

But in most universities, teaching method of economics is still traditional. Teachers talk and talk while students listen and listen passively for examination. This traditional method has the following prominent problems. Firstly, put emphasis on theoretical knowledge and ignore practice. Secondly, pay too much attention to teaching, but ignore students' autonomy, initiative and creativity [2]. Even if teachers have taught hard, students still have difficulties to understand profound

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theoretical knowledge. There is overwhelming evidence that experiment played a positive role in training qualified talents [3].With students personally involved in the teaching, experiment is more intuitive, comprehensive and creative compared with theoretical teaching. Therefore, faced with the problems that traditional teaching method have , it is necessary for teachers to do a large number of experiments in order to improve teaching quality and train qualified talents.

2 Design and Implementation of Experiment

Here the author takes demand curve experiment as an example. A demand curve is generated by the changing price of the commodity and the quantity of the consumed commodity [4]. When students study demand curve, they only passively learn the relationship between demand and price through the demand curve in textbook. Here we will design an experiment for students to participate in the simulated market and purchase goods personally. Finally, we can draw a demand curve according to the commodity quantity which students themselves bought at different prices. Thus students can understand the demand curve more deeply.

2.1 Experiment Place and the Number of Participants

Experiment can be arranged in classroom or in laboratory. In each experiment, students may be divided into two groups, the buyers and the sellers. Each group has five members. Before the experiment, each group member is given a card and the card records different information as shown in Fig. 1.

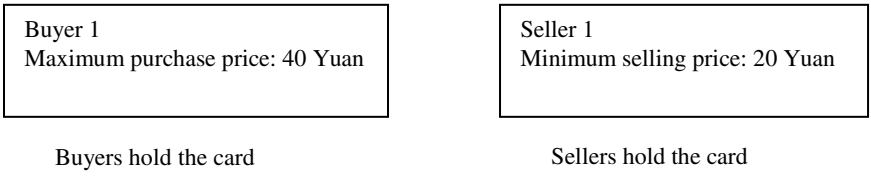

Fig. 1. Cards information

2.2 Experiment Explanation

After issuing the cards to participants, the teacher should read experiment explanation to them. Experiment explanation is the one that represents participants the experimental purpose, defines the resources, information and initial endowments they get as well as introduces participants' reward payment rule. The following should be paid attention to [5]:

Avoid *competition*, *conspiracy* and other words that imply experimental purpose;

Prompt students not to disclose their private information;

Do not suggest students what behavior is correct, or is the desired behavior;

2.3 Record and Process Experimental Data

In the experiment, the buyers will ask price as low as possible and the sellers will require price as high as possible. Each transaction price and quantity should be recorded.

After the experiment, the earnings each participant get will be calculated according to the following formulas. Each participant will be given a score according to the earnings they get.

earnings buyer get = ∑(maximum purchase price - actual transaction price).

earnings seller get = ∑(actual transaction price - minimum selling price).

Draw demand curve according to the transaction price and quantity (as shown in Fig. 2).

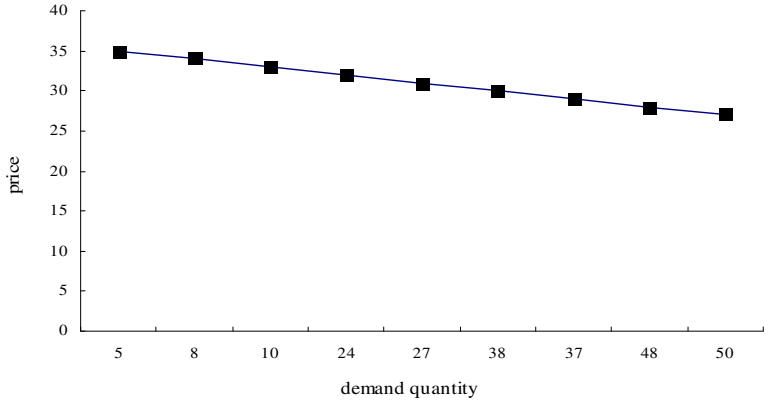

Fig. 2. Demand curve

2.4 Discuss and Explain Experiment

After the experiment, questions about the experiment should generally be set. For the above experiment, the following questions will be set:

Can you complete the transaction smoothly? If you can not, you think why?

What is the law of transaction price during the experiment?

What is the relationship between demand and price?

With the experimental experience, students always answer questions actively, rather than answer reluctantly as before. The accuracy of answers is also higher than before. When teacher gives theoretical explanation, students do not feel it profound and boring but understand it more deeply. Thus, doing experiment, rather than teaching only, can improve teaching quality.

3 Deviation of Experiment and Reality

Real economy is very complex and market behavior subjects to a variety of factors. In this sense, it is difficult to design experiment completely consistent with reality. Teacher should recognize that the purpose of experiment is that students can understand economics theory more deeply, but not that the realistic environment must be simulated completely.

Therefore, when teachers design an economics experiment, on the one hand, the real economics environment should be simulated in experiment as far as possible. On the other hand, teachers should consider that the economics system in experiment is very simple compared with the real economy. For example, in the above experiment, only price is considered, but in reality the factors which affect demand are very complex. In fact, it is not helpful to achieve the complexity of reality in experiment, and we shall not achieve the purpose of experiment if experimental environment is very similar to the reality [1].

4 Conclusion

Economics experiment plays an important role in improving teaching quality. With students exposure to simulated economics environment, experiment is conducive to improve students' powers of perception and better developing their ability to analyze problems. Economics has much connotation and extension, so it is possible for teachers to guide the students to learn actively through experiment. Thus teachers not only can teach profound theory, but also can stimulate students' learning interest. Therefore, economics experiment will greatly improve teaching quality.

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Construction of Digital Learning Platform for Ocean Universities' Advanced Mathematics

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Abstract. Digital teaching platform is a new teaching management model using network and multimedia. The digital teaching environment based on the computer multimedia technology, network technology and modern educational technology has become the basis of the main aspects of environment of education and teaching institution of higher learning. It is the important task of the related institutions that how to involve advanced ideas of education, computer technology and the Internet into the teaching process for the teaching service and improve the teaching quality of the advanced mathematics of marine universities in the present era. In this paper, how to construct the teaching platform of advanced mathematics is discussed after introduce the blackboard teaching platform, including online teaching, multimedia, video courses, practice teaching and so on.

Keywords: marine universities, advanced mathematics, digital teaching platform.

1 Introduction

With the development of the computer and information science and technology, multimedia and network technology promote the rapid development of modern educational technology and teaching platform for digital education is a major trend. We should build the digital resource center for quality courses and three-dimensional materials facing the national higher education and build a number of digital learning centers which have exemplary role and services, achieve the opening of teaching resources for improving the life-long learning system.

Our universities is a professional colleges based on life and ocean, and the advanced mathematics course is a public class facing our undergraduate. The advanced mathematics course plays an important role in higher education, it is not only all of the theoretical basis of professional science and engineering courses, but also has been included in the teaching program within the liberal arts, while it is important to cultivate habits and learning methods for college students. Currently, the students including all undergraduate and specialist professional should learn advanced mathematics, such as marine engineering, civil engineering, and the students of English and Japanese professional should learn math or calculus. It is an urgent and important task that build a digital network of higher mathematics teaching platform to meet the development of higher education in the new era.

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2 Blackboard Teaching Platform

Blackboard online teaching management platform is the only supported platform for the teaching of one million users on the market, which has nearly 50% market share in the United States. There are over 2800 universities and other educational institutions using the product, including the famous Princeton University, Harvard University, etc. Blackboard online teaching platform provides a wide range of teaching resources, opens up multiple channels to achieve student. Blackboard platform as the core curriculum, with four independent functional modules.

2.1 Resource Management of the Content

Through this module, teachers can easily publish, manage and organize the teaching content. Teachers use teaching tools of the control panel to allow students to access learning materials at any time and place In the course district.

2.2 Online Communication

It can also provide users with asynchronous and other communication tools to enhance learning. We can create an unlimited number of forums that allows a variety of ways and themes to achieve the learning interaction In the discussion area, classify information according to the discussing list, author, date or subject, track read and unread messages, also collect more information for easy reading, comparison and printing, etc.

2.3 Assessment Management

Generate the test data by the original test database, randomly generate exam paper from the database and repeat use, create statistics reports of the student answers, comprehensive weighted scores on the homework, tests and examinations and automatically get comprehensive evaluation scores.

2.4 System Management Functions

We can easily register or logout groups of students or personal information, statistic the student progress, scores and generate statistics reports.

3 Design Platform

The course platform includes classroom teaching materials, such as courseware, exercises, experiments, textbooks, reference materials, interactions reflect the network classroom. Meanwhile, in order to enrich students' knowledge, add a "Resource Development" module. Specifically modules are as follows:

(1)Course description: introduce the main course and the role in learning the follow-up subjects.

(2)Teachers: teacher information, team structure, teacher training, the video of the representation teaching of teachers.

(3)Course information: syllabus, teaching calendar, teaching lesson plans, homework assignments, final examination.

(4)Training videos: videos of lectures on higher mathematics masters, expert lectures of the graduate math test.

(5)Experiment: introduce matlab, maple, spss and other mathematical software and frequently questions.

(6)Self-test system: higher mathematics exam.

(7)Construction materials: own teaching materials, the senate teaching materials.

(8)Teaching and research: teaching reform, teaching and research topics, teaching and research monographs, papers, academic issues papers.

(9)Course forum: technology exchange forum, Q-face courses.

(10)Mathematics Olympiad column: download questions over the years, theory exam.

(11)Mathematical contest in Modeling: exams, and other commonly used methods of mathematical modeling.

(12)Postgraduate column: exams and answers of postgraduate over the years, website link, simulation questions and videos.

(13)Resource development: related sites.

(14)Download forum: multimedia courses, commonly used software.

The establishment of the online teaching platform offers a variety of learning resources for students to learn in the vast space, and reflects the diversity and advanced of the modern education.

4 Teaching Platform Effect

(1)It is the most obvious effect of the blackboard platform that broke the time and space constraints of the traditional teaching. Teaching activities are no longer confined to the classroom, "teaching" and "study" was conducted in the same rich and varied extra-curricular. Teachers prepare lessons on the platform, assignments, organizing online exam, Q & A, discuss the teaching content, upload information, preview and review, make homework, exam in online and teachers and other students in real-time or non real-time contact. Since introduced the platform, our relevant teachers have connected the blackboard platform wtih the existing classroom teaching and carried out the assisted instruction activities based on the web.

(2)We optimized the configuration of curriculum resources with the blackboard platform. This online course resources include several forms: basic resources, online course text, graphics, images, animation, audio library, video library, academic disciplines of basic symbols and basic graphics library, etc, integration of resources, teaching cell library, case library, test library, FAQ library, reference library and shared software libraries. Practice has proved that, with the Blackboard

platform, content can be told more complete, organized more clearly. Secondly, teachers can effectively control the progress of education under the control of the teaching process.

(3)Blackboard platform enables interactive teaching between teachers and students. The interactive features of blackboard platform mainly reflected in the discussion board, namely teachers set the topics for discussion according to the teaching content, while students express their opinions, ask questions.

(4)Checking the quality of teaching by the blackboard platform, teachers can view student the participate in classroom situations, student interaction situation, and analysis the situation of the students acquire knowledge.

5 Conclusions

In recent years, we have built a fairly complete network teaching system through the construction of the digital platform for advanced mathematics based on the Blackboard platform. Using construction of this platform, we have changed traditional mathematics curriculum model, teaching activities extended to the class, broken the time and geographical constraints. Paradigm shift in teaching also improved student learning initiative, and changed the traditional passive acceptance of knowledge to acquire knowledge for the active learning of knowledge, so personnel training center will be transferred to the learning ability of students. Although the teaching network platform can not substitute for our traditional teaching mode, it brings new ideas, new methods of education and teaching reform.

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Lecture Notes in Electrical Engineering: Necessity to Add Undergraduate Education of MEEM in China

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Abstract. The long-term development of medical equipment industry has to rely on the key technology of medical electrical fields. Due to the development level of China's higher education is lower than foreign country in this field, the necessity analysis on establishing the Medical and Electrical Engineering Major is carried out in this paper, through analyzing national macroscopic policy and regional economic planning, based on provincial construction plan of Heilongjiang, in order to conform to the trend of the times and developing situation of the trade. Considering the overall above evaluation factor, the personnel training model is proposed finally with characteristic of the combination of medical, mechanical and electrical fields so as to improve employment rate and promote steady and rapid economic development and social harmony and stability.

Keywords: Medical Equipment, Higher Education, Specialty Establishment, Medical and Electrical Engineering Major.

1 Introduction

From the perspective of the current status of China's medical equipment industry using foreign economic investment and technical cooperation, these foreign companies in China haven't bring some advanced technologies so far, merely capture market. After entering WTO, there can be no substantial progress in economic and technical cooperation in a short time. But in the long run, it benefits for China's companies to make more effective use advanced scientific and technological achievements and knowledge resources. How to make better use of foreign advanced medical equipment. It needs us to start from the fundamental works, and study advanced technology so as to strive to develop proprietary products for medical equipment as much as possible. The future practitioners of medical equipment should have a higher level of professional standards and foreign language, strong computer skills and interpersonal communication skills. Medical and Electrical Engineering Major (MEEM) with characteristics of multi-disciplines is just an important part of the key technologies in the development process of medical equipment product. Therefore, it is urgent to train a large number of high-quality medical electrical and mechanical engineering professionals.

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2 Demand for Industrial Development

Medical digital, information-based is the main direction of global medical equipment technology development. It is the most important guarantee to achieve medical "lossless" and "precise". These industries formed by digital and informatization medical products is the knowledge-intensive industries with high concentration of new technologies and the highest value-added (40-50% or more). It is the most competitive areas in the international and domestic market.

Now, it is still low in the overall level of medical equipment in China. There are 15% of medical instruments and equipment produced before and after the 1970s, and there are 60% produced before the 1980s in 175,000 medical and health institutions [1]. Their renewal process is a gradually release process. It will ensure the growth of the medical equipment market in the next 10 years or even longer. To accelerate the development of the medical equipment industry has become an important strategic plan of economy development.

3 National Policy Support

The implementation of “New medical reform” provides a good environment of Innovation and development for local enterprises. Considering the current actual situation and development trend of future health care industry, it should accelerate the upgrade of older products in China, prior to develop high-quality, affordable products, and active to design physical therapy equipment and family health care instrument [2].

In recent years, the introductions of a series of national policies were introduced in succession, which has brought new opportunities for the medical equipment industry. It is first time to put the development of medical equipment industry into the outline of the National Program for Long-and-Medium-Term Scientific and Technological Development issued by Ministry of Science and Technology. It requires our higher education institutions to quickly seize this opportunities to train high-quality, high-level mechatronics undergraduate talents who have basic competencies of designing medical equipment with high intelligence [3]. These works can reserve talents for occupying the global market of high-end medical equipment to better serve the diversified economy and promote social harmony and stability.

4 Regional Economic Development

The State Council has approved and promulgated more than 10 regional plans or guidance at past two or three. These mainly aim to fully apply the Scientific Outlook on Development and serve for Major National Development Strategies. Under the international economic crisis environment, it should be done to keep rapid stable economic growth so as to promote the balanced development of region economy and construction of harmonious society. MEEM is focusing on medical

equipment industry, senior industry, etc. Let take Heilongjiang Province as an example.

Now, there are a total of 2.189 million disabled people which accounts for 5.72% of the population in Heilongjiang Province. Compared with the first national sample survey of disabled persons in 1987, there are some increase to a certain extend at the total population and proportion of disabled people. These both have a direct impact on economic development of Heilongjiang Province. To solve this problem not only need lots of medical professionals who know to use rehabilitation therapy equipment, but also need auxiliary appliances including wheelchairs, waling aids, ankle foot orthoses, and so on. It is a huge consumption of resources.

5 Provincial Construction Planning

In order to implement the strategic mission presented at the 17th National Congress of the Communist Party of China, which is giving priority to education and turn China into a country rich in human resources, and to raise the level of higher education and the capacity of servicing to the development of economy and society, the government of Heilongjiang Province formulated the higher education planning for strongly constructing city. It emphasizes that, surrounding our provincial adjustment of industrial structure and replying on the provincial institutions of higher education, the training program of the urgently needed talented persons must be carried out by playing advantages of school-enterprise cooperation and reforming and innovating personnel training model. This program expressly states that, taking Jiamusi University as the lead unit, there will be a medical training base and training centre using for training lots of designers and engineers of medical equipment to better serve their manufacturing and maintenance areas. During 2010 to 2015, there will be 45 to 110 thousand trainees in medicine, information technology and other related.

6 Supply and Demand of Professionals

6.1 The Specialized Talents of Rehabilitation Equipment

Modern rehabilitation medicine was introduced into China 20 years ago has developed very rapidly. Rehabilitation center, rehabilitation hospitals and rehabilitation discipline in general hospitals continue to emerge across the country. Forms the sharp contrast with this is rehabilitation equipment specialists are in short supply. Tang, the Vice Chairman of China Disabled Persons Federation, revealed that there are 36 million disabled people need for rehabilitation. Also, there are 410 thousands patients with cerebral palsy, 6 million stroke patients and 16 million mentally ill, and half of 1.2 billon elderly man who both need for rehabilitation. But since the Seventh Five-Year Development guidance, there are only 10 million people who have received rehabilitation. Lack of personnel is an important reason for developmental lag of rehabilitation.

6.2 The Design and Manufacturing Personnel of Dental Implant Body

Prosthodontics, an important part of stomatology, is a clinical discipline that involves numerous and complicated process of operation. And Planting repair technology has been extensively carried out in the field of oral medicine. But such as the high cost, low precision, and small series products are some important factors for restricting the domestic nowadays. According to a survey, the Chinese oral cavity state of health presents because of the age, but different minute stratification. The proportion of people missing teeth is higher which is far worse than in Europe and other developed countries. However, due to severe shortage of personnel, the research and development process is slow nowadays. Therefore, it is worth training lots of personnel who master CAD/CAM technologies for designing the series of dental implants products.

Summary

Considering all factors above-mentioned, we firmly believe that actively foster lots of higher engineering technology talents, combining medical and engineering and combining mechanical and electrical, which is not only in keeping with the trends of social development but also addresses business development and employment needs, in order to improve employment rate and promote steady and rapid economic development and social harmony and stability. It is fortunate that the Ministry of Education has granted six colleges to establish the “medical equipment engineering” professional (NO: 080626S). It can be seen that the government has recognized the importance of training personnel in the Medical and Electrical Engineering fields. Therefore, the establishment of MMEM is imperative.

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Research on Construction of College Student's Entrepreneurship Education System

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Abstract. The development of entrepreneurship education is a complicated system engineering, depends on the state, society, universities, enterprises and individuals in all aspects of support, efforts and cooperation. This paper expounds the present situation of college students' entrepreneurial education and the necessity, entrepreneurial education system from college students in our country construction principles, the transformation of the notion of education, entrepreneurship education discipline construction and course teaching system, teachers' construction, enterprise practice base, social security system and the spirit of the entrepreneur education of the concrete analysis, and at the end of entrepreneurship education are given evaluation system construction.

Keywords: College students, Entrepreneurship education, System, Construction.

1 Introduction

Obtain employment is the people's livelihood, this new venture is the source of employment, education, training students in business of creative ability is the global higher education development and reform is an important trend, college students' quality education and innovation is an important part of education. In the current grim employment situation, in school education, carry out internal business help and support has the ability of college students for entrepreneurial, will become graduates of a new flow society of employment way, to help ease today's society of the employment pressure, the implementation of expanding employment development strategy that promotes entrepreneurship, actively promotes employment to encourage and support for college students on their own innovation, to broaden the channels of employment mechanism of the important measures. So to develop the students in entrepreneurship education theory and practice research, establish a sound their career education system of high efficiency, to enhance students' entrepreneurship education, to cultivate college students' career consciousness and entrepreneurial spirit, the improvement of college students' creative ability, for promoting innovative country construction, to develop their talents, promote the university students' self development, and broaden the channels of employment, all have the important significance and function .

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2 Analysis of Present Situation of College Students Entrepreneurship Education in Our Country

In the college students' employment situation background, to enhance students' education of business backlash, and in foreign university.Born in carrying out entrepreneurship education, cultivate the students' entrepreneurial skills and initiative of the higher education (Paris declaration of education concept) cause of the party and the government attaches great importance to, many universities in China have started to set up entrepreneurship education center, and carry out research or entrepreneurship education and research work, in the open entrepreneurship class, to explore the entrepreneurship education method and entrepreneurship research has made some preliminary results. In 1997, tsinghua university held a business plan competition, in 1998, in tsinghua university school of management in the first for the entire school undergraduate opened a new and high technology venture management course. Promote the entrepreneurial education of college students in China. In 1999, the department of education has released the first century for 2 education revitalization plan of action ", and points out that: "strengthening on teachers and students of entrepreneurship education, encourage them to independently high-tech enterprise", put forward the concept of "entrepreneurship education". In the same year, the group the central organization the first "the challenge cup" national college students business plan competition, the competition continued to present, and constantly expand the scale and influence. In April, 2002, the ministry of education GaoJiaoSi determined China people's university, tsinghua university, Beijing university of aeronautics, Shanghai jiaotong university of 9 universities such as for our entrepreneurship education pilot colleges. The second half of 2003, the ministry of education of the first stage entrepreneurship education held the backbone of teacher training, the university's 200 teachers participated in the training. In September the same year established nankai university venture management research center, for the undergraduate and graduate students and doctoral open entrepreneurship and enterprise growth aspects of the curriculum. In 2005, xiamen university launched the sex of the college students' entrepreneurship plan and elective course of practice. In this period, universities have begun a step-by-step and levels for entrepreneurial education to the exploration. And has been formed three modes: (1) to the people's university of China as a representative, emphasize the education "business focus on the cultivation of students' business consciousness, constructs the business knowledge structure, perfect for students' comprehensive quality"; (2) to Beijing university of aeronautics for represent, to improve the students' knowledge of the venture.

At present, although our country have been aware of the importance of entrepreneurship education, but from the national university to see, the work environment still appear very weak, entrepreneurship education is still in developing the discussion, and improve the understanding, a few of the pilot phase, also do not have wandered full implementation, the implementation of the general atmosphere and conditions, especially in the local colleges and universities, entrepreneurship education in particularly slow process. From the current development situation of entrepreneurship education, see the development of the central television is not

optimistic, and by the end of 2005 to the current situation of the college students' entrepreneurship, a survey of college students would like to venture was achieved 80%, but really can practice only 4.2%.

3 The Necessity of the College Students' Entrepreneurship Education

3.1 College students and the related knowledge level business are relatively weak. The college students' entrepreneurship range is very wide, according to the subject of different for each. The science and engineering college students' entrepreneurship many is based on its technical advantages. But, entrepreneurship is a system engineering, need after market research, the capital and other resources, the value realization technology to raise a series of activities. In the process, not just technical contest, but also management idea, management and operation ability, and other aspects of the competition, it is required to market marketing, finance entrepreneurs cost control, business negotiation, tax, law should have certain knowledge accumulation, but, if college students in university period is not ready for the business, and won't go to the study of the knowledge, and the school and not the students of science and engineering in open this basic courses, lead to the undergraduate of knowledge of these entrepreneurs, improve the entrepreneurship compare deficient in the process of work pressure, reduce the possibility of business success. SheKeLei students the business is mainly services industry types, retail, trade and industry, these industries don't need too many technical support, but for the entrepreneurs of management ability and market to develop ability have high requirements. SheKeLei though students during the university study the enterprise management, economic and trade the professional knowledge, but the textbook knowledge is a theory support just, should practice to get a better understanding and application, but practice education on the China's higher education is the soft spot for entrepreneurs in university, during the study of human resource management, financial management, production management and marketing management, economic law, tax, intellectual property rights and the lack of understanding of the knowledge, also affected its in the process of starting to these subjects the application of knowledge ability.

3.2 Entrepreneurship related skills are limited. Entrepreneurial activity involves market observation and prediction of resources, as well as personnel of the coordinated management, internal and external relations, namely, only to have the good market development, leadership, coordination, communication and interpersonal ability, etc, to ensure the smooth development of the college students' entrepreneurship activities and succeed. These skills can not go to school in textbooks, can only through constant practice to accumulate. And the current our country entrepreneurship education in college students' practical ability training has many defects, such as practice platform construction, students' practice of adverse less chance; Entrepreneurial activities held to a limited extent, and number of times, and so on. The college students' entrepreneurship on the skills to get caused tremendous disadvantage in college students' education, is business must be a barrier.

Due to the lack of practice chance, causing the college students in science and engineering limited, whether social experience or SheKeLei students are only empty have technology or theory knowledge, and a lack of market judgment, the marketing means, industry and commerce taxation, financing, legal transaction processing and other professional experience, entrepreneurs can't adapt to the present college students the changing market environment and the fierce market competition, caused the failure of entrepreneurial activity.

3.3 Enterprise, the psychological quality of college students lack the business environment is not loose, and there is a college students' entrepreneurship must be "to do great things, creates the great undertaking" idea obstacle, which affects the success rate of the college students' entrepreneurship. The ministry of education a 2004 report, the country's 97 opened earlier students profit of enterprise, make up only 17% of students, founded the company, in 5 years only 30% can survive. In 2007, according to the company's survey, zero their career success rate is only 0.01%, this is almost equal to zero. This shows that there are entrepreneurs in college students' psychological not mature business of phenomenon, for any business prospects blind optimism, it is too simple, will the business often comes down to money and difficult material specific problems. Because colleges and universities in the college students' entrepreneurship in education, the lack of quality in the heart, lead to college students' not set up the business high ability, good setback adapting ability, strong will, hard struggle spirit venture psychological quality, in the face of market in the fast changing and the fierce market competition, the challenge of pressure, or in the process of starting frustration, prone to cynicism, give up entrepreneurial activity, which results in such activities as the phenomenon in the process of starting hard to succeed.

4 Construction Principles of College Students Entrepreneurial Education System in Our Country

College students' entrepreneurial education system construction should be integrated into college of new training system. College students' entrepreneurship education system construction is not as the additional training system, but in training system reconstruction, the formation of entrepreneurship education value as the basic guiding thought of the new training system. And to have to reconstruct the original training target, professional and courses, the course content, training channels and methods of review and fixed, and to comply with the modern market economy in our country the demand of talents. Only for the training system reconstruction, college students' entrepreneurship education system construction, just have the survival foundation and conditions. Otherwise the college students' business system and the past due to their training system and lose the heterogeneity of the value of its existence.

And the talent cultivation and specifications and types of the unification of principle. Each college training target, different teaching history, managerial level and the level of training talents is different, so their career education system construction should have different requirements. But in general should with

university's talents specifications and types are unified. To research university is concerned, cultivate knowledge innovation, technology innovation, entrepreneurship is the building of the basic position. And for general undergraduate course for university, training information analysis and processing of innovation, entrepreneurship and explore market, develop the market of entrepreneurship is the building of the basic position. And in higher vocational colleges is concerned, should focus on training technical innovation, technology innovation and entrepreneurship to come up. In short of talent training, different specifications, different types of training, the entrepreneurship is endless also and same.

And service faces and regional economic development requirements are unified principle. After several years of practice education popularization of higher education in China, the trend of the development of the layered gradually clear. Different levels of university because of its service faces in different areas and their career education system construction, the requirement is endless also and same. Different service faces the heralds the university provides the service product, service category and service level in the same way. And in different areas of the industry structure, market space and natural resources situation of college is entrepreneurship put forward different requirements, the decision of entrepreneurship education of the contents, methods and means different. Therefore, college students' entrepreneurship education system according to the service faces the region economy and the requirements of the development of creative to construct, avoid by all means is separated from the social practice, free space, go in for grandiose projects to build.

Open entrepreneurship education system construction principle. To construct the university student's pioneering work education system, aims to entrepreneurship education system to function, make the student system students to build up their awareness and ideas, and make the business opportunity, can prompt capture and through its entrepreneurial behavior accumulation entrepreneurship practice experience, achieve finally business purpose. Entrepreneurship education system construction not simply pursuit of cultivating mature, entrepreneurship, but through the training of the pioneering consciousness and entrepreneurial skills with the talent, make it into the society after gradually become entrepreneurship. That is entrepreneurship education system construction is not to develop the mature, entrepreneurship, but as for the target have entrepreneurial potential talents training target, it the cultured, entrepreneurship is a kind of open entrepreneurship, this talent has obtain employment and entrepreneurial dialectical properties. Graduate employment, not equal to that lifelong employment; At that time did not obtain employment, can we therefore think that it can't start business, we can not to graduation time engaged in what the classification and qualitative, and should develop the eye and to build entrepreneurship education system of open. Universities should abandon all employment, enterprise, formalized, final with social and things on the talent market certainly and of college sure for value goal.

In order to create the value guidance for the core principles. University student's pioneering work education system construction is the core content of creation. So in college of entrepreneurship education system to be through this concept, advocate innovation spirit. In the construction of professional education

and to deal with the relationship between entrepreneurial education, the humanities quality education and entrepreneurship education relationship, professional practice ability and entrepreneurship education, and the relationship to create for fusion point, advocate teachers have to be creative, students will learn creative teaching. The teaching content, teaching method to innovation. Advocate create a beneficial to create teaching environment, to create a form for highly music and innovation to the proud of teaching atmosphere. At the same time to construct the creation of the value orientation teaching incentive mechanism, and gradually formed a innovative training system.

5 College Students and the Entrepreneurship Education System Construction

Entrepreneurship education as a new education concept, put forward to practice is from a continuously explore and gradually improve process. To construct university students' education system, business is a system engineering, it not only to build up the scientific education idea, the venture through various education way to cultivate the imbarking consciousness, business thinking and entrepreneurial skills, etc. Various kinds of entrepreneurial comprehensive quality, and finally to college students has some ability to initiate and build positive atmosphere, establish to adapt to the characteristics of the contemporary college students' training, management mechanism, all-round, multi-angle comprehensive construction. Therefore, entrepreneurship education should run through the teaching of each link, the student individual growth throughout all phases of the various work of the school through them.

5.1 Build up the scientific, education thought the right business, for entrepreneurship education in colleges provide the most basic theory security. Entrepreneurship education is to cultivate students the pioneering consciousness, entrepreneurial spirit, creative ability and entrepreneurial character for the purpose of a kind of education activity, it is not only a kind of education practice, is also a kind of education thought. To make career education concept becomes the new time higher education new ideas, first to change the education idea, set up the business of education values education. Social and students to the business needs, requires universities must change education concept, adjust the personnel training mode, in the curriculum, teaching content, teaching method, credit evaluation etc are explored and reform, through the development of entrepreneurship education, cultivate the students' basic quality of entrepreneurship, and improve students' ability to survive, the competition ability and creative ability, so as to make it a social development and demand of the high quality of compound talents, and then "enhancing the ability of independent innovation, building the innovative country".

5.2 Perfect entrepreneurship education discipline construction and course teaching system. The traditional course design method the biggest drawback is to impart knowledge is fragmented, course and course, this and no intersection between the entrepreneurs of quality requirements for the opposite. To this, we design the following: (1) the integration of professional disciplines, and relying on

the industry and commerce management, human resources management and business practice close departments, a entrepreneurship education discipline, discipline, be responsible for the entire school entrepreneurship education course planning, organization, management and performance evaluation, investigation and study education and professional education of business between the logic and compatibility, research, development entrepreneurship education teaching materials. (2)The multi-level education curriculum business, on the one hand, to open a series and venture closely related financing, law, management, such as success to learn business guidance curriculum, on the other hand in specialized courses teaching entrepreneurship education, expand the subject penetration professional education application fields. (3) To reform the teaching method, teaching entrepreneurship class KAB reference model, into the case analysis, business games, scene simulation, vivid, flexible teaching methods, training students' independent and rational questions, thinking, the ability to analyze and solve problems. (4) From teaching evaluation index, to establish the curriculum assessment as the core, the teaching method, the student to obtain assessment is to focus on the innovation ability as the goal of teaching evaluation system.

5.3 Make experienced entrepreneurship education teachers college students. Entrepreneurship education of the smooth implementation, cannot leave a high levels of entrepreneurship teachers. High levels of entrepreneurship education teachers team is to cultivate college students' quality, enterprise, business ability of the important guarantee. It will need to build a know both theory and practice, experience, firstly, the theory and practice of both "double teachers" team, colleges must put the selection and training career education of high quality teachers mention agenda, must increase the important entrepreneurship education professional training of the staff efforts to introduce and strength. To establish a diversified teaching staff, as send a group of teachers colleges can take relevant training, or to the enterprise a line, also by the regular practice from foreign entrepreneurship education employ experienced teachers or from the enterprise, government hiring has the actual management experience, business experience and investment experience professionals and successful entrepreneurs, economic management class leaders to do the guest professor, regularly for college students, and students lecture communication with the practical case, help students to enhance their awareness, add entrepreneurial activity, and eventually reach the practice of university teachers' rich management experience, multi-channel creating excellent and professional entrepreneurship education teachers team objective.

5.4 Build enterprise entrepreneurship practice base.Enterprise is for entrepreneurial education of college students practice base, is the cooperation of the base to foster talents, also an important input to the human resource base. Yet at the moment, many school of entrepreneurship education mode are often limited to impart knowledge to students, and no type of practice opportunities and more enough development space. Entrepreneurship education, in the final analysis, it is a kind of practical education. Entrepreneurship education in the top priority is to establish stable entrepreneurship practice base. Stable entrepreneurship education practice base is the extension of the entrepreneurship education, is enterprise practice, this will be for college students platform entrepreneurship practice provide

more practice or simulated training opportunities, can shorten the college students to enter the society period of adjustment of college students, the practice of building business broad platform. Can go through the combination of the university and the model of enterprise practice base, is a combination of production through the way of the student entrepreneurship practice base was founded, strengthen the practice teaching link, to cultivate students' innovative practice and entrepreneurship practice ability; it is also through the school-run enterprises, research institute, scientific research and development companies, such as a certain amount of money to raise its revenue-bringing divisions, a venture fund, organization, to provide students with practical exercises. Place business Entrepreneurship practice base created can also a set of matching risk investment funds, will effectively promote entrepreneurship education development.

5.5 A strong entrepreneurial education of college students' social security system.The development of the university student's pioneering work education requires the integration of various resources, to get the support of the community and cooperate. To strengthen college students' business policy guidance, from the company registered, tax, technical support, management consulting, and legal aid all aspects such as college students to tilt, through the substantial business venture policy encourages university student's pioneering work. In the meantime, even joint bank lending institutions, to increase college students' autonomous venture financing strength. In guarantee lending institutions under the premise of the safety of fund, through to the venture project evaluation, provide preferential loans and even an interest-free loan, duly simplified examination and approval procedures, improve loan business loans for examination and approval, the maximum efficiency play the functions of the career development loan. Countries also through the business regulations to build entrepreneurship education of the social security system, entrepreneurship education for the college students get legal support. In addition, still can establish a business consulting center, professional skill training institutions for college students' education, business offer public services.

5.6 Strengthen the entrepreneurial spirit education.About business, have a field in China has been overlooked, that is entrepreneurship, and this is precisely where the university can play a great part. Entrepreneurship education in foreign universities is in the ascendant. In the United States, from the university of all business schools to community college, to public schools and even the primary and secondary school education everywhere entrepreneurship education with the related courses. The so-called entrepreneurship education mainly focus on brewing and create a new enterprise need knowledge. It includes business opportunity recognition, resources organization and investment, enterprise organization to create, etc. Entrepreneurship education will venture as a complex system and process, so pay more attention to entrepreneurs elementary knowledge and the overall quality of the comprehensive training. Therefore, the universities want to do some basic work in education, the entrepreneurial spirit, the students, to venture capital industry, it has an even more profound significance.

6 Construction of Entrepreneurship Education Evaluation System

To construct university students' venture evaluation system, it is not only improve the success rate of university student's pioneering work of providing theoretical guidance, but also have the important meaning to the effective development entrepreneurship education . Of entrepreneurship education evaluation system including the main content of courses, teaching means, core technology, market prospects, entrepreneurial teams, the innovation ability and the project risk, etc.; Evaluation objects, enterprise, is the entrepreneur group and entrepreneurial core technology; Evaluation is the school principal, risk investors and appraisal institution.

Entrepreneurship education in college students in the process of practice, establish scientific and effective entrepreneurship education certification system. One is the main body to the entrepreneurship education itself evaluation objective evaluation of entrepreneurship education course, ensure the entrepreneurial education can realize the goal, through the evaluation information feedback to improve and optimize entrepreneurship education. Second is to the entrepreneurs, business team for entrepreneurial quality evaluation, etc. The implementation of university student's pioneering work quality certification system, using the existing knowledge is the ability to solve problems for object, by the "performance" for the index of a test.

In the evaluation method, want to pay attention to three things: (1) the vertical evaluation is given priority to, horizontal complementary evaluation. Entrepreneurship education whether knowledge and the ability to form, or consciousness and psychological quality change, need a long process, and vary from person to person. So we can't blind competition between that students. For entrepreneurship education, it should be vertical evaluation is given priority to, to guide the students to constantly updated, improve and develop their own. (2) With the aid of self evaluation is given priority to, people think of services. Entrepreneurship education is to cultivate entrepreneurial and innovative consciousness, have for sex, independence, dare firm confident people. So entrepreneurship education in a self evaluation is given priority to, can not only strengthen the quality of the students, also can let students get rid of others, so that the bondage of thinking more easily get business success. (3) Social evaluation to give priority to, the school evaluation of services. The teacher's eyes of "good students" or "good heart students students', does not mean that later can venture, become a "good entrepreneurs, even through all" social practices the inspection, the enterprise education should evaluate maximum limit close to the social reality. Entrepreneurship education in university is a new subject, the development of school education evaluation by, on the one hand, the assessment of teachers' teaching, on the other hand check their own have loopholes in management, to the existing problem adjust in time.

Summary

In short, entrepreneurship education is the education workers and spare no effort to perfect the long-term education and carry out an entrepreneurial education activities, which can improve the students' business interests, training students' team spirit, and strengthen the student's experience, and convenient for inspection students to master the knowledge and entrepreneurial skills of the business. Strengthening entrepreneurial education has become the world's modern education development and reform of the new trend. However, from the universities of China venture education and entrepreneurship and the present situation of college students to situation, our country entrepreneurship education is still in theory, it needs to be exploring stage university, enterprise, society and the government is exploring, and the entrepreneurial education college education throughout the always, and further education mechanism, reform education transformation contents, education method and talent cultivation mode, through the face all student of entrepreneurship education and based on partial aspiring business students' creative ability, strengthen special training to education object of the pioneering consciousness and creative ability of the students, to meet and adapt to China's economic and social development of the needs of our country at the same time, the education comprehensive reform targets will increase to a new level.

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Research and Practice of the Practical Ability Training at Independent Colleges for Applied Talents

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Abstract. The goal of independent colleges is training of applied talents. In education of electrical information specialty, the most important is practical ability. There was some problem in old training program, curriculum, teaching methods, textbook, etc. These problems can not meet the demands of the practical needs. This paper introduced several specific ideas and practices in education of electrical information specialty in Zhijiang College of Zhejiang University of Technology. Practical teaching was emphasized on an important position .Revised of the training program, increased the proportion of practice courses, update content of practice courses, prepared book and experimental teaching material written our own. The optional practice courses were provided. Improving the practical ability of teachers and students .Implementation for many years proved that the effect is ideal.

Keywords: Independent college, Electrical information specialty, Applied talents, Training of practical ability.

1 Introduction

Independent institute has play an important role in supply applied talents and services of local economy. The continued rapid development of local economy also increased the desires for applied-innovative talents. Competition required higher demands for teaching reform of higher education. Zhijiang college of Zhejiang University of Technology (ZJC) has provided large number of advanced application talents for Zhejiang since 1999. There were many difficulties and contradictions in the process of its running as the characteristics of independent institutions themselves. There are also many problems in education of the electrical information specialty. Mainly in the following aspects: ①Although the development program is no longer rigorous scientific system of the elite stage of education, but it is still basically science-oriented. The engineering characteristics are not obviously. ②Curriculum and training methods is traditional. The actual curriculum is focus on theory. The proportion of practice training is lower.

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③Means and methods of teaching are sole, Opportunities of students practice is fewer. ④ Practical ability and innovation ability of the teachers themselves needs to be increased.

Key issues need to be addressed is practice. The student's practical ability is most important. Our college has been reforming and practicing in the past few years. The reforming is concentrated on practice ability. Exploring several specific ideas and methods actively, a comprehensive set of training model is build up.

2 Attaching Importance to Practice Teaching in Amendment of the Training Program

Based on the demand of employment market in Zhejiang, We insist on the principle of "laying a solid foundation and emphasis on application" in the amendment of the development. Foundation course is insured. Professional course is grasped "less hours, lower center of gravity, and newest knowledge, wide oriented". Raise the ratio of practical course from 10% to 20%.

2.1 Multi-direction of Training Program

There was only one training direction in old training program. We offered a choice of training program for students. Several training direction were designed. Each training direction is supported by certain number of block professional course. Each block strengthens the quality and skills of students in certain areas. The electrical information specialty and their different directions of ZJC are presented in table 1 below.

Table 1. The Electrical Information Profession and its Direction

Electrical Information Profession of ZJC	Major Direction of Profession
The computer science and technology profession	The direction of hardware The direction of software The direction of network The direction of Digital Media
The automation profession	The direction of electrical automation The direction of electronic signal control
The electronic and Information engineering profession	The direction of signal processing The direction of Intelligent Instruments The direction of automatic identification

2.2 Improving the Contents of Practical Course1

To adapt to new technology, we adjust the content of professional practice. Table 2 shows the added new professional practice courses and contents.

Table 2. The Comparison of Content of Practical Course

Electrical Information Profession	The Ole Practice Content(Comprehensive Experiment)	New Added Practice Content(Comprehensive Experiment or Application Design)
The computer science and technology profession	Data structures, Computer components, Computer and interface, Databases, Computer networks, System software	Web site design, DOS, Graphics software application, Oracle site development, MAYA animation, Game engine,.NET programming, JAVA programming and its technology in website building, etc
The automation profession	Computer and interface, Motor control systems, Computer control system	Microcomputer application, PLC application, MATLAB and its applications, Manufacturing practice, Motion control system, Management information systems
The electronic and Information engineering profession	Analog electronics, Digital electronics, Circuit, Data communication	Embedded systems, DSP applications, High-frequency electronic circuits, Professional Integration, Data communications and computer networks

3 Construction of Practice Teaching System Adapting to Abilities Training

Fig1 shows the practice teaching system of electrical information profession in ZJC. This system includes three respects. It should be noted is the fact that all of the modules are compulsory except the module circled by dotted line.

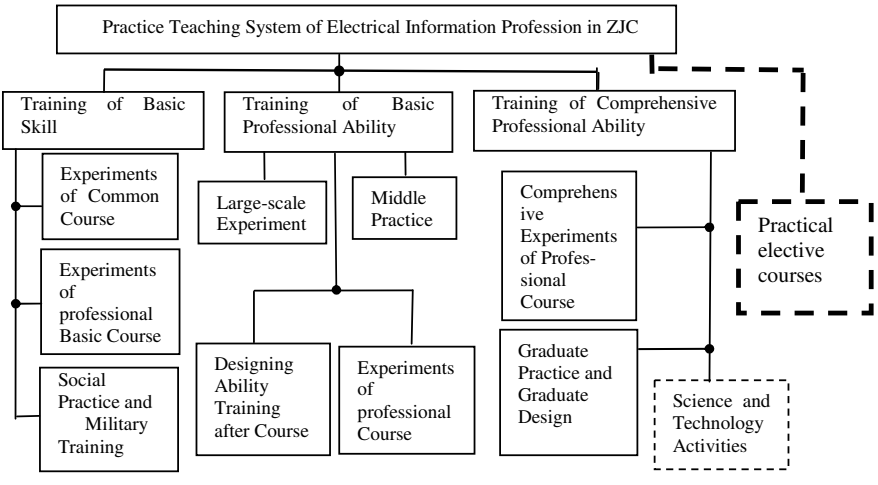

Fig. 1. Diagram of Practice Teaching System of Electrical Information Profession in ZJC

Elective courses had been public basic courses and humanities, arts, economics, management courses. Practical courses and professional courses were all required. This is clearly not enough. Fig1 show the practical elective courses' block in black dotted line. For example, "Practical Electronic Circuits" is an elective course. We opened this course after "Circuit Principle". The content of it is mainly resistance, light emitting diodes, buzzer, alarm, etc. The purpose is stimulating interest of student, help them recognizing popular electric components and devices, knowing how to using common software, instruments and meters. The elective courses are divided into three types. There are dozens of practice elective courses opened in recent years. Some are showed in table 3 below.

The setting of practical elective courses changed the composition of elective courses, enriched the practical ability-oriented teaching plan, and formed new branches of training program. The logical structure of training program is more reasonable.

Table 3. Part of the Practice Elective Courses Opened In Recent Years

Types of elective courses	Name of elective courses
Software Types of elective courses	Introduction of multimedia software applications, Web design, The basis of three-dimensional animation, The basis of three-dimensional virtual game production, Asp dynamic web site development, ACM algorithms and programming
Hardware Types of elective courses	Practical electronic circuits, Barcode technology and application, Computer assembly, maintenance, and basic settings, Radio assembly ,conditioning and testing
Software and Hardware Combined Types of elective courses	Computer aided design for electronic systems, Very-high-speed integrated circuit hardware description language design for complex-programmable logic device/ field-programmable gate array

4 Preparation and Publication of Theory Teaching Book and Experimental Teaching Material

Independent colleges are different from normal universities and colleges. The most fundamental difference is the students.As the student's basic knowledge, hobbies, intelligence, motivation and learning methods are different. In order to adapt to the different for the students, according to our teaching experience and the different level of the students, some book involved basic theory are written and published. They are "Signals and Systems", "Principle of Automatic Control System", "Principle of Communications", "Digital Signal Processing", etc. Some new technology book is also published such as "Single Chip Computer", "Embedded System", "Object-oriented Programming", etc. At the same time, some book involved experiment such as "Experimental Course of Assembly Language Programming", "Experimental Course of Software Engineering", "Experimental Course of Data Structures and Algorithms" are written and offered

to our students. At the beginning of writing ideas, the actual situation was taken into account.

5 Training and Improving the Practical Ability of Teachers and Students by Science and Technology Contest for Students

Teacher's training is the first step. A series of incentive policies were established. A number of teachers are send out into related companies about half a year or one year. The Innovation laboratory was set up also.

The main science and technology contest in IT is "National Undergraduate Electronic Design Contest" and "ACM International Collegiate Programming Contest". Contest was taken into accountant during each time when improving teaching plan. Also we make greater efforts to training our students during holidays. The practical ability of students is increased.

6 Implementation and Conclusion

In recent years, we reform the practical teaching system to meet the needs of social employment market in Zhejiang, exploring different way on improving practice abilities of our students. The setting of electric information practice elective courses is a useful supplement to practice teaching system. More autonomy is offered to the students and their knowledge is broadening. It is helpful to change the construction in knowledge and skills of students. It is helpful to the training of personality. Practice elective courses are welcomed by the students. Sometimes the attendance is up to 100%. The book and experiment book written our own are more suitable to the students. These books are welcome. The knowledge and ability of teachers are improved after teacher's training; some teachers are famous among students in contest guiding. With the practical ability of students increased, more and more awards of science and technology contest gained. The graduates are also welcomed. The employing rate has remained at higher level in independent colleges in Zhejiang province.

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Chinese and Western Cultural Conflicts under Sino-foreign Cooperative Education

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Abstract. With the acceleration of Sino-foreign cooperation in running schools, there are more and more cultural conflicts in the process of the management of college and university students. This paper discusses the cultural differences in students' ideological education and management under Sino-foreign cooperative education. Aiming at improving the ideological education to college and university students in the context of Sino-foreign cooperation, the authors analyze the potential influence and impact of Chinese and western cultural conflicts on students from such perspectives as the orientation of students' management, the new challenges for ideological and political education, culture dominancy, etc., and explore more scientific and feasible ways for students' management.

Keywords: Chinese and western cultural conflicts, Sino-foreign cooperative education, students management.

1 Introduction

Culture is a fairly extensive concept. Diverse cultures of different value orientations and characteristics derived from different ethnic groups, regions and social systems in the development of human civilization. People from different cultures will show their own characteristics and inadaptability in interpersonal association and communication because of cultural differences. This inadaptation may have two manifestations: harmonious fusion, if both sides are compatible or mutually tolerant; or on the contrary, incompatibleness or even confrontation and opposition. The Chinese and western cultural conflicts discussed in this paper mainly refer to the incompatibleness, confrontation and opposition and between western capitalism-oriented dominant cultural elements and socialism-oriented dominant cultural elements on a Chinese tradition basis. Chinese and western cultural conflicts is also an issue of great concern in the management of university students.

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With the deepened implementation of its opening-up policy, China is developing rapidly in various aspects, and educational internationalization has thus gradually become a significant trend for China's reform and development of higher education [1]. This paper will take Sino-foreign joint universities, especially local ones as examples to explore the characteristics and methods of college students' ideological and political education under this circumstance.

2 Current Situation of Sino-foreign Cooperative Education for Cultivating Interdisciplinary Talents

Sino-foreign cooperative education in China began in the 1980s. According to incomplete statistics, the number of Sino-foreign joint schools in China reached over 600 in 2002[2], and there was a sharp increase to 1300 in 2006[3]. "Provisional Regulations on Sino-foreign Cooperation in Running Schools" and the implementation of "Rules on Sino-foreign Cooperative Schools of People's Republish of China", promulgated by the state council of China respectively in 1995 and in 2003, not only embody the state government's concern on Sino-foreign cooperative education, but also legislatively guarantee its sound development.

Currently, Sino-foreign joint schools in the field of higher education in China are mainly focusing on "unilateral input", i.e., introducing concepts, methods and teaching resources from the foreign side, and differ from each other in the depth and the width of cooperation. There are two basic forms of Sino-foreign cooperative education in China. The first one involves a credit transfer system which allows students to study both at home and abroad. In this mode, students will spend 1-2 years learning English courses and some basic courses in China, and then 2-3 years at overseas university to accomplish specialized courses of a certain major and get a degree or diploma of the foreign university or even two degrees from both domestic and foreign universities. The second form is to cultivate students within China by creating a stimulating language environment thorough introducing international teaching concepts, modes, methods and teachers.

3 Difficulties in the Management of Students under Chinese and Western Cultural Conflicts

In the internationalization of China's higher educational reform, due to the lack of scientific and theoretical guidance and experience, it has become a universal phenomenon that most Sino-foreign colleges and universities, especially those local ones, blindly follow western cultures. Facing the differences between Chinese and western cultures, faculty and staff in students' management sectors tend to let students slide or drift in the cultural conflicts resulted from the differences between Chinese and western values of time and money, communicative languages, dietary habits, values of ideals and conducts, etc., which will throw themselves in the dock in the management of students.

3.1 Undefined Orientation and Objectives for Students' Management

After more than 20 years of development, China's Sino-foreign cooperative education is still in its start-up period. In the early period of its development, very little experiences could be leaned from due to high cost of running schools and difficulty in employing foreign teachers. On one hand, most colleges and universities, especially local ones, laid much greater emphasis on other aspects of running joint schools than students' management. To them, sending students abroad through cooperative programs is of foremost importance. The belief of their only task for students' management is to ensure students' safety and proper function of teaching. No attention was paid to the ideological and political education to students or helping students, who are facing the role conversion from middle school students to college students in psychological adjustment in their study and life. On the other hand, some local Sino-foreign schools transplanted the concepts, thinking models and working manners from general universities into their system, without noticing the specific features of Sino-foreign cooperative education and its differences form general schools, especially the great influence on students by the dominant cultural values in western countries. Therefore, the traditional mode and experience of students' management is fail to meet the demand of students' management faculties and thus leads to undefined orientation and objectives of students' management.

3.2 Students' Management Faculties Lack in Good Experience for Reference

Sino-foreign cooperative education, as a dominant mode of the international oriented educational reform in China, is getting more and more popular in higher education institutions, especially in coastal open areas. However, the entirely different teaching concepts and methods introduced from abroad that our students have never experienced as well as the value orientation and style of behavior will inevitably exert on the students influences in various aspects and great impacts in various degrees. As a result, students of individual differences will have different reactions to such a diverse and complicated environment that is totally new to them, which will definitely pose many new challenges to students' management faculties.

Because of the backwardness of Sino-foreign cooperative education, theoretical research on western education localization in China is in great need of further exploration. Very few achievements are seen in such aspects as the study on the general and specific characteristics and the way of developing Sino-foreign cooperative education, the psychology, emotions and behaviors of university students involved in Chinese and western communication, relevant information and statistics of influence on students' outlooks of world, life and value brought by western cultures, and the growth characteristics and needs of individual students. This will surely increase the difficulty for students' management faculties in dealing with students' problems. Moreover, the lack of good experiences for reference and little

innovation in working manner are critical problems existing throughout the process of student management and Youth League Committee and Students' Union affairs like extracurricular activities, and will lead to a series of problems in ideological and political education, such as ambiguous pertinence, lack of innovation, ineffectual efforts.

3.3 Traditional Ideological and Political Education Facing New Challenges

Students' management in western universities is student-service-oriented where there are no such things of distinct Chinese characteristics like specific "ideological and political education", "party construction" or "Youth League Committee construction". Western students possess strong sense of self-independence and marked individuality. Students' associations are more developed than those of Chinese universities. Students' management in Chinese universities is developing from the management-oriented towards the student-service-oriented. Yet, the differences in politics, economy and cultural values between Chinese and western countries form a big gap between the higher educational modes of the two societies, which will bring more difficulties to the traditional ideological and political education, construction of Chinese Communist Party and Youth League Committee for Chinese universities. These differences will inevitably bring to the traditional Chinese mode of students' management a lot of new changes and influences.

Sino-foreign cooperative education provides a convenient platform for the cultural exchanges between Chinese and western cultures. This platform has brought the exchange, conflicts and integration of diverse cultural values, habits and customs that makes the students' management and ideological and political education even more difficult. University students are in an important growing period typical of active thinking, strong ability to acquire new knowledge and accept new ideas, but they tend to sway with different cultures they encounter because of their immature values of life and world and difficulty in making analysis and judgment between right and wrong. Besides, some teachers from western countries will consciously or unconsciously over-beautify their won cultures and religions and act as keen promoters of their habits, customs and life styles. Students will thus easily develop worship towards western world, and this tends to impair their sense of collectivism highly advocated in socialist countries and weaken their sense of honor of being a part of the Chinese nation.

3.4 Chinese Culture on the Edge of Losing Its Dominant Position in Coexistence with Western Culture under Sino-foreign Cooperative Education

One of the important functions of cultural values is to fundamentally influence people on their ways of viewing and understanding the world. All cultures have their own reasonableness of the existence and deny any principles of right and wrong [4]. It is difficult to evaluate the merits and demerits of a cultural value, but

it is the necessary outcome of every dominant mode of economic production that its culture will outweigh those of other disadvantaged modes, and this culture will certainly exert great influence on people's thoughts and judgment between right and wrong.

In traditional Chinese culture, people purse for harmonious interpersonal relationships, and they view collective interests much more important than personal interests. So personal interests and personal development are always supposed to make concession to collective interests, if the two are in conflict. Quite on the contrary, one of the value orientations of western culture is individualism. With the deep rooted individual-centered value in their mind, western people tend to think and to judge independently, and realize their individual value and the maximization of their personal interests through efforts. The differences between the above two cultures are obvious. Therefore, in the face of the strong influence and impact of western cultures, students of Sino-foreign joint schools tend to show such problems as weak self-cultural identity, lack of self-confidence, indistinction of the dominant position of their own national culture, etc. These problems put students' management and ideological and political education in bigger predicament.

4 Strategies for Students' Management in the Context of Chinese and Western Cultural Conflicts

Internationalization is the inevitable choice and inexorable trend for the reform of higher education. However, the immaturity of Sino-foreign cooperation education in China has lead to students' maladjustment in Chinese and western cultural conflicts which consequently brought many negative effects. What is even worse is that it may stray from its right direction of serving the state and national interests. Therefore, it is significant to consider how we could realize the localization of international education by successfully transplanting or introducing from abroad the advanced educational concepts and methods and integrate them into China's higher education, especially into Sino-foreign cooperative education. How to overcome the difficulties brought by cultural conflicts and improve the students' management so as to achieve sound and rapid development of Sino-foreign cooperative education, is the focal point discussed in this paper.

4.1 Clear Orientation and Further Research of Students Management Are of Great Importance for Improving Students' Intercultural Communication Abilities

Sino-foreign cooperative education "is an integral part of China' education"[5]. The task of students' management in this context is to ensure the realization of the objective of "cultivating talents of various disciplines for China's socialist construction"[5]. "Radically, we should take full advantage of international cooperative education to improve the overall quality and comprehensiveness of the whole school"[6]. So the management and education of students plays an important role under the cross-cultural education background where frequent cultural collisions

occur. On one hand, students' management faculties should improve their own cross-cultural communication abilities, guide students to have correct evaluation on cultural differences and properly handle the problems caused by these differences. Also, they should help the students to improve their ability of judging a culture and cross-cultural communication skills so as to ensure the socialist orientation of Sino-foreign cooperative education. On the other hand, it is of great importance to carry out theoretical and empirical study on students' thinking and behaviors influenced by multi-cultures, explore the characteristics, nature and law of the influence on students of Chinese and western cultural collisions and hereby build a more feasible and effective system of students' management as well as ideological and political education.

4.2 Maintaining the Dominant Position of Chinese Culture to Weaken the Negative Effects of Chinese and Western Cultural Differences

Chinese traditional culture, exerting deep influence on the development of the whole Chinese nation, has not only a long history, but also unique charm and advantages. This is because the Chinese nation, not only has inherited the excellent national cultural traditions, but also has absorbed the essence other cultures; it not only adhered to the collectivism-centered socialist values, but also introduced the scientific people-oriented thoughts. So it is very important to maintain the dominant position of the fine Chinese traditional cultures, introduce and apply the good concepts and expertise of management in both Chinese and western cultures, and interrogate these concepts into the whole process (including design, organization, operation and management) of students' extracurricular activities. This can effectively reduce the negative effects caused by the collision of the two cultures.

4.3 Realizing the Complementation of Advantages of Chinese and Western Cultures to Establish An "1+1≥2" Cultivation and Evaluation System of Interdisciplinary Talents with International Horizon

Various problems caused by cultural collisions are in need of wide attention and objective handling. On one hand, we should confront these problems and positively recognize the merits of western cultures through cultural exchanges and mutual understanding that helps to realize the complementation of both cultures' advantages, which will lay a foundation for solving problems that arise from cultural collisions. On the other hand, based on the respect for cultural differences and students' individuality, we should give full play to the advantages to both cultures. There are two important ways of ideological and political education to students: first, developing Communist Youth League and students' union, especially building a good team of students' leaders and popularizing continuous education to Chinese Communist Party members; second, helping students to develop good attitude toward study. The core socialist values, through the above two ways, can be

integrated into the design, organization, operation and evaluation of students' extracurricular activities. Excellent students from different circles may be set as examples and impetus to encourage all other students to make efforts to achieve progress, through which we can create a better studying and humanistic atmosphere typical of "self-confidence and self-improvement, self-esteem and self-respect, rationalism and democracy, innovativeness". This will bring a fair, open and multi-cultural environment and platform for education and development of students. In such environment, there is harmonious coexistence of Chinese and western cultures, good interaction and effective exchanges between foreign teachers and students. By establishing a "1+1≥2" cultivation and evaluation system of interdisciplinary talents with international horizon and realizing the complementation of advantages of both cultures, we will be able to orientate students to their study and personal improvement, learn to seek common ground while accepting existing differences, learn to cooperate with others, and value team spirit and democratic consciousness.

5 Conclusion

Whatever forms the Sino-foreign cooperative education takes, it is its main task to improve the quality of students through introducing successful experiences from aboard in this field, create good environment for language learning and lower the cost for education. Only by in-depth study and research on cultural differences, can we understand where these differences derive from and how they develop, figure out a feasible way to handle problems caused by cultural conflicts. This will allow us to seek common ground and reserve differences in educational cooperation and maintain its harmonious development.

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Research and Reform of CDIO Engineering Education Mode

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Abstract. By adhering to the principle of "learning for applying", production, study and research are combined to guarantee the teaching quality and research ability in our education mode reform. This paper outlines the international CDIO engineering education concept, industry-university Cooperation for Laboratory, development of teaching programs, cooperating operation into theory teaching, and "learning by doing "teaching method. In order to find a CDIO engineering education mode suitable for Chinese students, automation discipline (systems integration) training program is designed, practiced, and developed.

Keywords: CDIO, engineering education, learning by doing, automation systems integration.

1 Learning and Researching Carefully, Developing Training Plan

CDIO (conceive, design, implement, operate) is a new international engineering education mode.[1]And some research about CDIO mode should be carried out by Chinese universities to solve their own problems, instead of obeying CDIO rules completely. In order to deepen the reform of engineering education mode, improve the quality of engineering education.[2]"Learning by doing" teaching method, industry-university Cooperation for Laboratory and international education are important for higher education development strategy of global economy, they support and merge each other, and they are indispensable[3][4].

To made our training plan, we did lots of research on international CDIO concept, had some reports from experts, we also did some research about certain enterprises and universities, and invited some business representatives take part in our discussion sessions such as Mitsubishi Electric Ltd. (China), GE General electric Company (Shanghai), Siemens Numerical Control Ltd. (Nanjing), MG Automobile Co., Ltd. Shanghai, CNC Machine Tool Co., Ltd. Nanjing etc.

In our reform, engineering practice was emphasized in the training plan, some measures were taken. First of all, the proportion of practice in the education sector was highly increased on the bases of some necessary theoretical knowledge: in our basic course and courses, theoretical knowledge and practical knowledge ratio was 1:1, and the classrooms were our laboratories. "Learning by doing" teaching method was achieved. Second some courses were brought forward to first and

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second semester, integrated electronic system design and training were the main task during first semester to fourth semester, system integration design and training were the main task during fifth semester to seventh semester, and the main work in seventh semester and eighth semester were production practice and graduate design. In our education mode, basic experiment skills training was taken seriously for fresh men and sophomore; professional skills training was important for junior and senior students. Third, students were divided into some groups, and all the groups would have the opportunity to familiar with the professional hardware and software equipments in our professional laboratories. These groups would also take part in several kinds of design and innovation Competitions and had some training about automation system integration.

2 School-Enterprise Cooperation Experimental Base, Constructing a Multi-level Practice System

When we executed the CDIO engineering education mode improvement, some problems in university practice education was found.Introducing a variety of quality resources at home and abroad actively, carrying out the multifaceted cooperation with the community are good ways to solve our problems. We cooperated with many famous companies and built lots of first-class laboratories which guaranteed our automation system integration discipline CDIO engineering education mode practice learning platform.

In recent years, by unremitting efforts, we cooperated with many international famous companies from 9 countries such as America, Germany, Japan, etc to build several laboratories, experimental centers and training centers; the total amount was up to 91.84 million RMB. At present, we have built 23 build labs such as Mitsubishi Electric Automation Laboratory, Siemens Advanced Automation Joint demonstration Experimental Center, GE Automation System Integration Laboratory, Bosch Rexroth Mechatronics Experimental Center, Mitsubishi Electric laser processing machine Laboratory, Delta Automation Experimental Center, Weinuo Si Han CNC machine tool training center, Swan NC Simulation Laboratory, Asia-controlled Kingview automation software laboratory, U.S. Cypress PSOC Joint Laboratory and so on. The total assets of hardware and software in these build labs are 86.76 million RMB, and the total use area is about 7600 square meters.

3 Developing Our Own Equipments and Integrated Practice Education Content

During the school-enterprise cooperation, companies invested a lot of advanced industrial products. In order to apply these products to the education reform, and show our students the most advanced products and technologies in school, by learning new techniques and researching, teachers designed our own teaching equipments, developed experiments and training projects and prepared teaching materials and handouts.

In recent years, a variety of 167 units (sets) of the experimental devices, involve electric and electronic, single chip, EDA, PLC, automation, process control, robotics, CNC, production lines and so on, have been independently developed, which played a significant role in practice education. Through developing experimental devices, our labs were enriched, and we earned lots of teachers with solid theoretical foundation and strong hands which were popular with students.

The equipments provided by build units were the most advanced devices, and most information was supplied to manual mode. In order to make full use of them, by secondary application and development, our teachers developed a large number of designing, comprehensive and innovative experimental projects. Besides 18 teaching materials and handouts with new content and higher applicability were completed, which were used in our education reform and chosen by other similar universities and technical training.

4 "Learning by doing" Teaching Method, Improving Teaching Quality

"Learning by doing" teaching method was full implemented in automation systems integration discipline reform, the 6-week series of integrated electronics design and training Series and 12-week comprehensive system integration design and training, is the embodiment of it. The former was a electronic control system comprehensive training for freshmen and sophomore, and the latter a professional comprehensive training for junior and senior. In these two stages, students not only learnt a variety of theoretical knowledge, information inquiry, design, production and project control but also practiced project production and control, wrote reports, drew drawings, made PPT, participated replies, managed and attempted teamwork, which was a comprehensive training for students and was also a most effective way to improve the students' quality and capabilities.

5 Effectiveness of Reform

Compared with other classes in NJIT, the Comprehensive capacity of students in automation system integration reform pilot class was significantly improved:

Improved Practical ability. There was lots of time for students studying in labs and build labs, they can in touch with number of real advanced technology and modern products from internationally renowned companies. They did subject design and project training, with the help of "learning by doing" methods, their practical ability was greatly improved.

Improved innovation ability. We provided students with a good extra-curricular science and technology innovation platform, and strongly supported them participate in various competitions. At present our students took part in National Electronic Design Contest, Automation Design and Innovation Competition, Robotics Competition, Engineering Training Competition and so on. Through competitions, the students' design cooperating, communicating, reporting and other processes level were significantly improved, and their overall Innovation ability was greatly increased.

Improved personal qualities. By cooperating with GE, Mitsubishi, Siemens, Bosch Rexroth's and other international companies, not only will their business equipments, products introduced to the laboratories, more importantly, their corporate culture, management, science and technology knowledge be brought into the teaching. In the experiments, practice and training, students will realize the concept of world-class corporate culture, technical standards and the integrity of the attitude of interaction with others, work standards, etc and enjoy the culture, the influence of these companies. Their personal qualities, cultivation are rising continuously.

Improved employment levels. Through learning and training in the laboratories students mastered some of the company's products, types and application technology quickly. Learning from the employment situation of the students in the laboratories in past few years, their employment unit is of higher innovation level and their salary is much better. And obtain graduate students have also been welcomed and affirmed by their mentors.

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Reform on Curriculum Project in Management Information System Based on Project Management Technology

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Abstract. A large amount of well-qualified and applied-technique-oriented graduates are required in recent years in China, therefore increasingly attention must be paid to practical teaching to increase the education quality. This paper firstly analyses present situation and existing problems in curriculum arrangement, quality assurance and personnel organization in the curriculum project of management information system (MIS). A reform on current MIS curriculum project based on the project management technology is proposed subsequently, and the detailed implementation plan is described from four stages, that is, startup stage, plan stage, implementation stage, and check stage. In the reform on curriculum project, the students are organized in project teams, a milestone is set up to control the project process, a quality assurance system and quality-monitoring framework with regard to curriculum project are also established and the performance management and objective management are implemented in the MIS curriculum project management.

Keywords: management information system, curriculum project, teaching reform, project management technology.

1 Introduction

In the year 2002, higher education in China historically entered the stage of internationally-recognized popularization, which marks that the transformation from elite education to mass education will become an important theme of higher education in the future[1]. In the process of education transformation, many universities and colleges are aiming to cultivate students to be highly specialized and applied talents.

From educational psychology prospective, it is believed that forming skills promotes increasing ability [2]. Without a doubt, Projects are one of the most important approaches to form skills gained from teaching curriculum. In universities and colleges, students obtain abundant practical opportunities which help them to apply theory knowledge to solve real questions.

The MIS curriculum project is one of the practical teaching steps. This course aims to improve the students' information technical skills and develop the ability

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of discovering, analyzing and solving problems [3]. Therefore, it is worthy exploring how to reform MIS curriculum project to cultivate well-qualified talents.

2 Existing Problems in MIS Curriculum Project

Firstly, the present arrangement in teaching curriculum is irrational. In general, MIS theory teaching is followed by its curriculum project, which is a serial manner [4]. In the manner, students are required to finish all assignments of information system development, involving information system investigation, analysis, design and programming within a short period (usually one or two weeks). At the same time, the students have to submit their project reports for evaluation of their projects. Obviously, the students have rare time to think and have to get through their works careless. Inevitably, this typical arrangement fails to help students understand knowledge and foster practical skills.

Secondly, the curriculum project quality is out of control [5]. In current teaching curriculum, teachers are unable to verify students' project quality because usually when students' reports are submitted, the unit period has come to the end. In the whole process, teachers cannot tutorial the projects and fail to control the quality.

Lastly, in terms of personnel arrangement, two approaches are available and usually be adopted. One is that every student finishes his/her project independently, and the other type is that 3-5 students compose a project group and complete a project together [6]. Both approaches have shortcomings. In the first way, the students may work overload to finish assignments on time. The second approach is that teachers may fail to verify work quantity of each student and mark fairly.

3 MIS Curriculum Project Reform Based on Project Management Technology

Project management is a kind of scientific management methods. The project team is temporary and dynamic. Project management emphasizes individual responsibility, carries out project manager system, implements objective management based on maximal benefit and has a set of perfect management methods [7]. According to the theory of project life cycle, the whole process of MIS curriculum project is divided into four phases: initiating, planning, implementing and checking.

(1) Initiating Stage: According to the specialty training goal, the MIS curriculum project syllabus is drawn up, in which the course goal, missions, process arrangement and testing method are defined in principle.

(2) Planning Stage: Teachers design the details of the MIS curriculum project with great care, including the process arrangement plan, the quality assurance plan, the test plan and the relative documents.

• Process Arrangement Plan. In the new process arrangement plan, the abovementioned serial approach is replaced by a parallel approach, in which theory

teaching, experiment teaching and curriculum project are done harmoniously at the same time. Firstly, the entire framework is decomposed into several smaller and manageable activities. Secondly, the logical relationships among all activities are defined, which is shown in figure 1. At last, the duration of each activity is defined according to the total hours of the course.

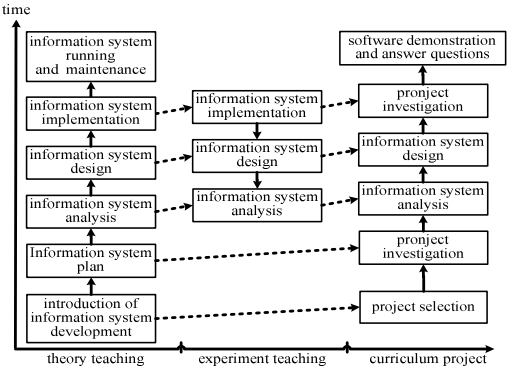

Fig. 1. Logical relationships among MIS teaching activities

• Quality Assurance Plan. At first, the MIS curriculum project milestone is defined, including selecting titles, investigating, analyzing, designing and implementing system, showing products and answering questions. Then milestone works and their quality requests are defined in details, for example, in system analysis stage, the students are asked to analyze system objectives, user characteristics, function requests, business flows, data flows, data resource distribution, management models, computer resource scheme and etc. The teachers check the stage reports and provide instructions without delay to realize quality control in the whole process.

• Test Plan. A final grade of MIS curriculum project is determined by two factors. One is the results achieved from the process of project and the other is the final report and software product. The process grade is further divided into two parts, including the result from stage reports and from group evaluation. At the end of the curriculum project, the MIS curriculum project grade can be calculated.

• Relative Documents. Teachers should prepare teaching cases and experiment materials to support MIS curriculum project. A teaching case should include all relative teaching materials, such as project background, system plan, system analysis and design reports and the execution of software. The experiment teaching aims to train students to write the reports and draw the graphs by means of the tool software expertly, for example, business flow diagram, data flow diagram, E-R diagram, function diagram, program flow diagram and etc.

(3) Implementation and Control Stage: personnel, process and quality management are involved in this stage.

• Personnel Arrangement. In this stage, all students are distributed to several project groups. Each group is composed by 3-5 students, one of whom acts as the

project manager. The project managers are in charge of drawing up the implementation plan, allotting works to each group member and coordinating the relationship among the group members according to the MIS curriculum project syllabus. Every group member must finish their own missions respectively on time. In order to ensure the right of the project manager, he/she gives each group member a score, which is one part of the total result, by the member's performance in the process of the project.

• Process and Quality Management. According to the process plan, each project group should submit its stage reports, including a project selection report, a system investigation report, a system analysis report, a system design report and a system implementation report. Teachers obtain information with regard to the real project development and quality by looking over these reports.

In each stage, teachers require 2-3 groups to provide lectures about their projects, and then comment on their lectures, finally summarize the entire project situation in the stage. This process attains three objectives, the first is to praise the good jobs, which can play a demonstration role, the second is to point out the common faults in the project reports, and the third is to train the ability of oral presentation.

(4) Checking and Summarizing Stage: In the last week of MIS curriculum project, the students should submit their final project reports, demonstrate their programs and prepare an oral defense of their submissions. Based on the stage reports written before, students have enough time to review the whole process and improve project reports. Through oral defense of the project report, both teachers and students can obtain an objective impression of the MIS project development process, summarize the advantages and disadvantages on time and provide more useful information for the future.

4 Conclusions

Bringing the project management technology into the MIS curriculum project enable students to finish their projects on time and enable them to learn how to develop and manage the real IT projects to meet the practical needs of information system development. The reform improves the students' ability of analyzing the existing problems, giving a possible solution and communicating with others, helps students to develop their thinking patterns of confidence, independence, creativity, and improve their behavior patterns of diligence, responsibility, cooperation. At present, the MIS curriculum project reform based on project management technology serves the teaching better.

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Lecture Notes in Electrical Engineering: Discussion about the Way of Training Mechanical Applied Type Undergraduate Talents

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Abstract. Further improving cultivating ways in applied undergraduate talent become to be an urgent requirement for the applied type undergraduate college. The educational experience of applied type undergraduate talents in western developed countries, especially in United States, Britain, France and Germany is explored. And the problems lying in mechanical applied undergraduate training mode at now stage is proposed. The project cultivating for machinery applied undergraduate talent achieved through those creative education actions such as teaching for engineering with characteristics, school-enterprise cooperation, quality developing and technological innovation activities and so on is put forward. The innovation ideas for the kind talent cultivating ways mentioned in this paper is not only favorable for the Practical ability training of students, but also benefit to the improving of comprehensive quality, it can be a attempt to the way of mechanical applied underground talent.

Keywords: Applied undergraduate, Training ways, Mechanical major, Engineering application, Creative education.

1 Introduction

With the strategic adjustment of the country's economy and industrial structure, and the rapid development of high-tech industries, a large number of high-level talents in application with both knowledge and skills are in a urgent need state[1]. Under this background, Applied Undergraduate Education as a new concept begins to put forward and to make into practice. Further improving cultivating ways in applied undergraduate talent become to be an urgent requirement for the applied type undergraduate college.

2 Experience Explore of Applied Undergraduate Education in Western Countries

According to the requirement of economic and social development, 50-60 years in the 20th century, developed countries vigorously develop higher vocational and

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higher professional education. 70-90 years in the 20th centuries, Applied Undergraduate Education is begun to develop, the higher education process to be popular and universal is promoted, which put the economic, technological and social development forward.

2.1 U.S.A.

Undergraduate level technical education exists in universities and technical institute in the United States. It's teaching plan gives more focus on application of experimental courses during the first two years, the deeper subject such as mathematics, natural science and general education is strengthen during the last two years [2].

2.2 Britain

The British multi-subject technical Institute, mainly cultivate technical engineers. Sandwich teaching plan of multi-subject technical Institute is with more special features. And it is sectioned and staggered to be carried on with classroom teaching and Industrial Training.

2.3 France

They combine school education with practice in real sector adopting work-study alternative system, and make students in different identities into real sector to practice more times, strengthen engineering cultivating for students, conduct applied research, understand the running process of enterprises, and promote the cultivation of engineering education.

2.4 Germany

German for the applied scientific technical university is Fachhochshule, with short FH for it. Its professional orientation of their graduates is technician for Medium and large sized enterprises or managers for small enterprises [3].

2.5 Experience Reference

Comprised with the practice of advanced country to be training applied undergraduate talents, common grounds are summarized as follows:

1) The emphasis on practice teaching in general, especially more emphasis on the actual exercise in society and enterprises;

2) Breaking through Standard curriculum system at different degree, arranged by according to the needs of professional competence cultivating.

3) Emphasizing both the Humanities and Social Sciences, focusing on the cultivating of manage ability, public-relations ability and presentation skills.

3 The Training Way of Mechanical Type Applied Undergraduate Talent

Cultivating for mechanical applied undergraduate talent can be achieved by those creative education actions such as teaching for engineering with characteristics, school-enterprise cooperation, quality developing and technological innovation activities, as figure 1 following.

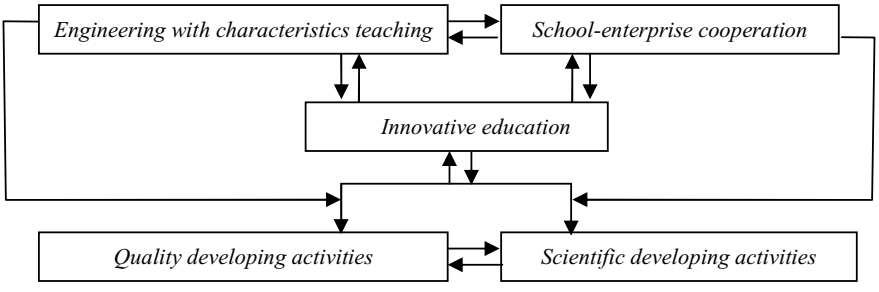

Fig. 1. The training way of mechanical type applied undergraduate talent

3.1 Optimization of School Circumstance Teaching System with Engineering Characteristics

School curriculum theory system follows the principle of emphasis on basic, suitable caliber, strong application. For combination of teaching and engineering practice, Curriculum and course content is optimized, proportion of the Optional Subjects is increased.

The proportion of synthetically and designed experiments should be increased on the aspect of school, experimental content arrangement. During the course of synthetically experimental practice and designed experiment, student-centered education thinking is outstanding, Independent study as a main line, The instructor's explanation of experimental rules to the students should be gradually reduced, so that students practice in solving practical problems and get exercised, increased capacity.

3.2 School-Enterprise Cooperation Cultivating

Knowledge and ability that owned by applied talent, most of them can be achieved in the actual workplace, not the only school education. The way of talent cultivating is combination of school and society, teachers and students combined with productive labor, combination theory with practice.

3.3 Quality Development Activities

Quality development activities mainly refer to develop the outreach activities as extra-curricular classroom activities carried out by the second for Communist Youth League and students. It aimed at developing the quality of students, guiding and helping the students to improve intelligence structure, full growth and success.

3.4 Scientific Technology Innovation Activities

Scientific technology innovation activities aims at cultivating and exerting students' personal specialty, encouraging and advocating college students to take actively participate in technological innovation, research and other scientific and technological activities, promoting the students hard working, improving abilities, bravely innovation, creating a supper education and scientific research circumstance in campus, So that students are educated in the activities, Increasing their abilities in innovation, Improving their qualities, Cultivating high-quality talent with innovative spirits.

4 Summary

Mechanical engineering science specialty is with strong practical major, which aimed at cultivating engineering technical applied talents, innovation idea of talent cultivating ways mentioned in this paper not only benefit to students cultivating practical ability, but also benefit to improve the overall quality of students, And it may be as a attempt of the way to cultivate mechanical applied undergraduate talent.

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Talk about Students' Ability Training in Teaching Practice Reform of Graduates from Engineering Course

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Abstract. The engineering students' ability training has put forward more and more high demand to talent cultivation in higher school. Combined with the steel metallurgical professional characteristic, from the direction of the cultivation of the students' practical ability, creative ability and general ability etc, the graduates' ability training has been discussed.

Keywords: students' ability training, teaching practice, engineering courses, practice ability.

In recent years, The materials of steel, non-ferrous metal, concrete and so on have listed first, but still there are unreasonable phenomenon for example producted construct and technological additional value, so, we need a lot of person with engineering implementation type to research and development new product, new technique and new equipment for high value-added product and efficient utilize. The Nei Monggol Autonomous Region has abundant resource, steel, non-ferrous metal and rare earth industry have became pillar industry, we also require many person with material engineering in the process of resource advantage transform into economic advantages.

Now, the requirement of society for the engineering graduates present growing trend year by year, this major's employment rate can reach 85 percent every time. The graduates distribute in large-scale metallurgical plant, machinery works and dependenced scientific research in 25 province, city, municipality on a nation wide scale, with development rapidly of our national economy, with business level of modernization the more the high, we demand also more and more high for this major's students. The requirements of project talents continuously increase in materials engineering. So, the major possess favourable prospect.

In order to adapt to request of new state, the contents of curriculum for the engineering students' ability training of Materials and Metallurgy have being improved, at the same time, teaching method and ideas about course also have being enhancing and advanced, paying attention to reinforce foundation, broaden profession, cultivate ability, reflect intersected mix together among subjects, update knowledge, cultivate students' engineering consciousness and thinking ability, make students

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acclimatizing themselves to social needs for talents and reaching didactical objective.

The development of society has put forward more and more high demand to talent cultivation in higher school. China's higher engineering education and business always pay attention to the engineering students' ability training. Guiding the student to play professional basis, expanding aspect of knowledge, enhancing students' ability has become the consensus of the higher education workers.

Cultivation of the talents depends on education. The teachers ' main task is to cultivate undergraduates who orient to social demand. Whether they have comprehensive ability has become one of main considered conditions to more and more enterprises and research department when they hiring, especially to engineering technology and management talents. In present undergraduate education reform, emphasizing the cultivation of students' ability deserve all educators special attention undoubtedly. Now training students' ability has a variety of forms, but one of the main forms is students' teaching practice.

Graduates' teaching practice is an important and final key link in engineering courses teaching steps .Its main contents include graduation field work and graduation design (graduation thesis), and its purpose is to make the students combine theory with practice in exercitation, strengthen the sense of spot, validation, deepen a theoretical knowledge; Cultivate students' ability of utilizing professional knowledge, theory synthetically and analyzing and solving engineering practical problem independently in the design. In order to achieve the purpose of improving students' ability and foster qualified metallurgy engineering and technical personnel, combined with steel metallurgical professional characteristic, graduation practice and design of metallurgical professional students have carried through reform exploration. Change internship and design of the past big range, no key, no criterion of "whole, light, pine". Highlight the typical, basic part of design that link to practice. Analyze the most basic and important site plant in practice. Conduct important require and design to the content of design key point. Keep position paper for strong and typical content. The other content requires conceptualization and more knowledgeable. This should emphasize to cultivate students' ability consciously at each stage.

At the graduation practice teaching process, only highlight phase, key, and overall the guidelines, so that we can effectively ensure the quality of teaching and improve graduate students' comprehensive ability.

1 Through Teaching Practice, the Graduates Can Combination Expertise with Practice, Strengthen the Perceptual Knowledge and Cultivate Their Practice Ability

Students have grasped certain professional theory knowledge after class teaching. Learning aims to practice, increase the perceptual knowledge. In a certain sense, graduation practice provides a probation opportunity for students to make professional knowledge to field practice. In order to make your design layout reasonable and the calculation correct, we must go into practice, manufacture, and employ

department to know survey. We should also consult all kinds of technical materials, design manual and rational, and select raw materials, frame process flow. In terms of engineering students, through teaching practice, they have more understanding to the major new technology, new equipment, new technology theory, rich professional knowledge and practical experience, and cultivate the students' practical ability. From simply imitation, imagination stage leap to creative thinking ability, it has great significance for future graduates on jobs, production practice and research work. This must arouse student's attention. In the past, many students consider practice as an prime entertainment, wasting time, causing a lot of students to disjoint theory and practice after graduation, they can't work independently for a long time. Even some students do not understand the backward equipment, process, much less design and innovation, to a certain extent**,** they hamper the development of improvement. Therefore, graduation practice teaching improves graduates of perceptual knowledge, graduates must act as bear protagonist in practice, change the idea, go to workshop with the problems , become students negative accepted as positive treat, inspire students' initiative and independence, from "I go locale" to "I want to locale" until "put the graduation practice finish"; By original "the emperor daughter don't worry to marry", then form so-called "want me to learn, I would learn" into social electing talents into "I want to learn I should learn".

2 Establishing the Reasonable Knowledge Structure, Leading Graduates to Develop and Train Themselves Is the Important Ways to Cultivate Students' Creative Ability

Generally speaking, cultivation comprehensive ability of college students has two important ways: one is external education training approach; the other is the inner development and training approach. External environment influence and the cultivation of university teaching process, become main approach of creation methods and comprehensive ability.

The purpose of the study is not only to know the world, and more important is to transform the world. Social needs is not only the theoretical level, and needs students who have the ability to analyze and solve problems, therefore in the process of creating pay particular attention to the cultivation of students' ability.

Creativity is a scientific and technological personnel's main ability, and it is developed and cultivated out constantly only in practice; It is the core of college students ability structure; It is a high-level thinking ability and activity ability. Therefore, , middle school students in order to understand necessity and urgency of cultivating creative thinking ability after they come to university. They must get rid of traditional education ideas. They dare to break through the traditional concept of courage and determination, and consciously train their creation consciousness, and diligent in thinking and doubt, and ask new questions, unceasingly strengthen creation ability, and guide students, dealing with the "rich" and "designed" relationship. Establishing a reasonable knowledge structure has the vital significance to students' creative ability. But in turn intelligence development can

promote knowledge absorption and master. Both have mutual connection and promotion. Extensive knowledge is reasonable knowledge's base. The development of modern science and technology is systematic, standardization. Extensive knowledge, and it is reasonable knowledge structure foundation. The development of modern science and technology is systematic, standardization. It ask for higher education infiltration and overlapping. So contemporary college students should be a just polyvalent generalists, they must grasp the professional knowledge, and understand the adjacent discipline knowledge. Proficient in professional knowledge is the main attack direction of the students' knowledge, is profound level Lord to learn the knowledge structure, and also learn the major indexes of the main success. Only own broad knowledge base and profound professional knowledge, we can have engineering awareness and innovation ability in the future.

The main ability that technical talents must have is the ability of innovation, which can be only developed constantly in practice. Innovation is the kernel of the ability structure of university students and the ability of thought and activity at a high level. Therefore, after entering the college, senior high school students must be aware of the importance of forming creative ideas, breaking away from traditional education thoughts, having the courage to break through traditional views, having the awareness to bring forth new ideas, thinking and querying frequently, daring to come up with new questions, strengthening the ability of innovation, dealing with the relationship of erudition and specialty, establishing logical knowledge structure. It makes sense to help university students have creative ability and become a useful person. Logical knowledge structure is the foundation of intellectual development. In turn, intellectual development can promote the absorbability and acquirement of knowledge. Both are interrelation and mutual promotion. Encyclopedical elementary knowledge is the foundation of logical knowledge structure. The development of modern science and technology is gradually becoming systematic, normal, and integrate. Each subject of higher education is required to infiltrate and cross mutually. Thus, nowadays, the university student should become an all-around person, not only master the professional knowledge, but have gained some understanding of the cross-discipline knowledge. Proficient in professional knowledge is the main attack direction of the students, the knowledge structure to the profound level, and the main index for students becoming useful. Only by mastering encyclopedical elementary knowledge and profound professional knowledge can students acquire engineering awareness and innovation ability.

Graduates' raise of creative thinking ability is simple to the theoretical study. It don't accomplish in an action, but the gradual increase. Taking part in teaching practice is one of the best way to cultivate creative ability. Teaching practice has practical significance of the application of knowledge, expanding knowledge, training skills practical role. In the teaching practice, we can understand the theoretical knowledge application, obtain the necessary on-site experience and facts material, consolidate and deepen the theory in the classroom, undertake the scientific research, the production technology subject, combine knowledge with practice, develop innovative thinking and integrated design ability, train independent thinking, independent working ability.

3 Use Synthesis Theory Knowledge, Train Comprehensive Ability and the Ability to Learn

In recent years, more and more information shows that social need both extensive knowledge, and college students with strong comprehensive ability. When graduation distribution is face the impact of market economy, implementation of "two-way choice", "job ', unit of choose is in no rush to ask," do you understand what knowledge? ", "Which course do you learn? "The unit will often ask:" what would you do? ".This just exposes students' weaknesses in the comprehensive ability. It shows that students' emotional intelligence far below the IQ shortcomings. At the same time, it affect engineering students not to adapt the new roles, post and work after working, and study ability is inferior , cultivating comprehensive ability and learning ability are imperative!

Graduation design is an important links of teaching practice of students' comprehensive applying their basic theory, the elementary knowledge and the basic skills; It formulates a theoretical analysis to a given design topic, based on the actual situation, frame design or experimental program, complete design calculation and protract drawings, compose specification and project report. It is an exercises opportunity for Graduates to get basic training engineers in the university study stage. Today's engineering design is not a simple "calculation add drawing". Whether from the design scheme or calculation checking to finishing the design specification and design drawings and the last defense etc, these are training process of professional knowledge, engineering practice ability and oral and written expression ability and scientific research paper writing comprehensive capability. Through the completed graduation design (including special studies, graduation thesis), its purpose is to cultivate students' scientific research ideas and study the problem and the ability to solve problems. Make students validate, deepen major theoretical knowledge, consolidate and expand professional knowledge, consciously cultivate students' engineering consciousness. Apply of computer in a graduation, progress computer calculation and CAD drawing, so that we can improve computer programming and operation skills. Through consulting foreign material, as well as the preparation of abstract in English and Chinese, the students can enhance their foreign language reading, writing and foreign language ability of flexibly.

In order to adapt to multidisciplinary, comprehensiveness, applications and so on characteristics about The engineering students' ability training , it is very important for curriculum learning and mastering to accomplishing quality of the part of teaching practicality. Before attending class, we would open cognition practice for two weeks which could make students having perceptual knowledge about relatively process engineering, and in teaching, we also open comprehensiveness experiments for ten class hours which are needed to reflect devising, opening and comprehensiveness.

- We would add forge and press transformation experiments and metallurgy-raw material-roll-product-docimastic comprehensive experiments. By operation of experimental design and experimental process, students can get comprehensive physical training and developing from combining theory with practice.

In a word, graduates' teaching practice in engineering colleges and universities is general skills training of using professional theory knowledge to solve practical problems. By taking the above teaching reform measures, improve student to learn actively, stimulate students' thirst for knowledge and innovation consciousness, consolidate the professional knowledge, promote their own ability cultivation of creative thinking. Carrying out education policy, adapting to the objective request of new period" talent quality ", achieving professional training objectives have played a vital role.

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Relying on the Discipline Superiority, to Construct Material Molding and Control Engineering

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Abstract. Through the materials engineering professional curriculum system construction and teaching practice, relying on the discipline superiority, pay close attention to training students to obtain information and application knowledge ability. Widening specialty knowledge, pay attention to professional systematization and holistic optimization design, especially with practice, comprehensive embody cross-disciplinary fusion, update their knowledge, constructing reasonable knowledge structure of professional students, cultivating the students' future work environment to the psychological quality and professional quality.

Keywords: Materials engineering, teaching practice, consciousness and thinking ability, Discipline Construction.

1 The Characteristic and Advantage of our Subject

Materials engineering is a level 1 discipline, composed of metal processing and metal materials heat treatment two professional direction. Metal stress processing and metal materials heat treatment began to enroll undergraduates in 1960 and 1980, got the material processing engineering and material science master degree program in 1996 and 2004. Along with the ministry of education majors directory adjustments, the two professional emphasis both renamed material molding and control and metal material engineering. Materials engineering, after decades of development, training a large number of high quality professional, has accumulated rich experience in teaching and solid scientific research foundation exhibition. The Teacher team and autonomous regions new metal materials key laboratories build a good foundation for the sustainable development of this professional.

After years of teaching reform and practice, material engineering formed their own characteristics on specialty construction and talents training, facing the whole

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country and autonomous region economic development needs, training high quality and strong ability of engineering applied talents. Cultivating a teacher team with a precise style, reasonable structure highly educated and high levels . The proportion of senior professional teachers is 69%, master degree above 85%, this professional focus on teaching and scientific research combined, bear a number of national scientific research projects, and published a large number of high level research papers, bearing fruit, promoting the scientific research achievements of this professional improving teaching. This graduate education in national ministry of education materials science and engineering evaluation ranked 49th. Cultivating graduates become the metallurgy and machinery industry, and get the high praise from employers. In recent years, graduates graduate employment rate is 80%, enrollment quotas is 15-20%.

2 The Integral Goal of Discipline Construction

Through school discipline construction drive "materials engineering" professional disciplines.

Materials engineering construction total goal is: through the materials engineering professional curriculum system construction and teaching practice, trains the student to have the good ideological and political quality, solid materials science and engineering basic theory and basic technical, strong engineering practice and computer application ability.

During the teaching process , developing the students' ability of application information and knowledge. Widening specialty knowledge, pay attention to professional systematization and holistic optimization design, especially with practice, comprehensive embody cross-disciplinary fusion, update their knowledge, construct reasonable knowledge structure of professional for students, cultivating students' future work environment to the psychological quality and professional quality.

3 Major Teaching Reform the Overall Target and Guiding Ideology

The goal of Material molding and control engineering curriculum reform: rely on discipline superiority, pay attention to professional curriculum system , constructing holistic optimization design and reasonable knowledge structure of professional for students, with emphasis on comprehensive and practical, cross and penetration to improve students' comprehensive professional quality, and cultivate students' comprehensive ability to analyze and solve problems for the target.

3.1 Reform Guiding Ideology: Comprehensive Combining with Practice, Paying Attention to Professional Characteristic, Establishing Opening, Research-Oriented Teaching Model

Implement "characteristics add the high-quality goods" for the school concept, basic training "moral fine, thick and broaden specialty" talent, reflect cross-disciplinary fusion, updating our knowledge and enlarge students' adaptation to face employment.

3.2 Reform's Overall Objectives

This professional training plan is divided into steel-rolling production craft, forging production process, mold design and manufacturing, and special processing new technology and so on four research directions, through professional teaching reform, graduate should have strong and comprehensive ability to analyze and solve problems, make it become senior technology applied talents for material molding and control professional.

4 The Content of the Reform

Optimization update key teaching content, optimize the teaching plan; Strengthen basic skill training, improve the ability of the students' to solve problems; Strengthening the teaching practice, set up a open and research-based teaching model, cultivate students' project consciousness and thinking ability.

4.1 Broadening the Professional Knowledge, Training Thinking Ability and Basic Quality as the Starting Point, Establish Specialized Talented Person's Knowledge, Ability and Quality Structure

According to the basic quality for students of professional request, unifies specialized features capacity requirements, design material molding and control engineering knowledge, ability and quality structure, strictly using the various comprehensive ability, professional ability and basic quality requirements determined by the professional teaching, to design the corresponding knowledge module, Its features: outstanding steel rolling technology application ability, reflect subject crossover and comprehensive ability's cultivating; Ability module setting has technology prospective and comprehensive of ability; Innovation settings "material plasticity engineering", the integration of professional research direction of the basic theory, optimize the structure of knowledge.

4.2 Optimization and Updating the Teaching Contents, Set Up a Open and Research-Based Teaching Model

For open teaching should first breakthrough teaching material, change teaching material dominant position into auxiliary position, and its name also should be renamed as teaching reference books, or main teaching reference books. Collect the latest live information to add to course teaching through the network. Second, teaching demonstration tool should convert from the blackboard and chalk to computer media, the animation, movie display dynamic formation process of knowledge and circumstance. Third, requires teachers to familiar with international related web site and can link them in the appropriate teaching time.

The investigative teaching is based on the teaching mode's main characteristics of scientific principles emphasize the forming process. The present way emphasizing teaching content should be process oriented, to emphasizing the subject concept and so on should show the origin and such research process to students, and guide students to show students' divergent thinking and stimulate the students' autonomous learning and explore motives, enhance students' participation in knowledge construction enthusiasm and conscientiously.

4.2.1 Optimization and Updating the Teaching Contents

① the classic content should be more succinct.
② introducing new technology achievements content more rich.

4.2.2 To Optimize the Teaching Plan Out

①Adopt heuristic teaching, mobilize students' learning initiative and enthusiasm.

②Develop class discussions, cultivate the students' study interest and participation.

③Use the multimedia teaching, on-line question-answering, and other means to deepen the students' understanding of the contents of teaching

④Establishing electronic document of teaching syllabus, realize the multimedia and network teaching

4.2.3 Strengthen English Skills Training, Makes the High-Quality Goods Courses

For specialized fundamental course: ***engineering plastic theory***, ***metal plastic deformation physical basis*** by bilingual textbooks in teaching mode, and make students learn professional knowledge, and that learning a foreign language. Will the ***plasticity engineering materials***, ***engineering plastic theory***, ***metal plastic deformation physical basis*** for the professional set courses. Implement "characteristics add the high-quality goods" the school concept,

In Chinese, English teaching materials and teaching methods, hand in hand with improves students' comprehensive professional quality.

4.3 Strengthening the Teaching Practice, Set up the Class Paper Link and Train Students' Projec : Consciousness and Thinking Ability

4.3.1 Update Curriculum System Training Mode

Professional elective are delimited to four classes(rolling class , forging, mold design class, special manufactured), students have more choices in developing students' autonomy, individual character and interest, professional elective amounted to open the total study period 300 hours (energy students can also choose more). Require students to learn in school, with 200 mentor under guidance of personality development. Optional professional class, continue to widen deepen knowledge, prepare for specific jobs.

Set the course of ***plastic molding engineering materials*** mainly elaborated that about material processing process deformation theory, technology formulating and process optimization professional basis theory. Reflect rolling and forging molding largest professional direction of the cross fusion, even more highlighted raw materials-as the main production-products on the rolling production characteristic, emphasis on the comprehensive and practical, cross and penetration, optimizing the teaching content, strengthen students' professional comprehensive skills training, improve the ability of the students' practical problems.

4.3.2 Strengthen Basic Skill Training, to Improve the Students' Ability to Solve Practical Problems

4.3.3 Reforming Experiment Teaching and Strengthen Students' Practice Ability

In the teaching attaches great importance to teaching experiment, create conditions, enrich the experiment content more experiments. Through the reform, reducing teaching hours, adding "material molding integrated experiment" 32 experimental classes, teachers attend guiding the experiment, improve experiment level, and gradually replaced by comprehensive experiments and the verification experiment. In 2007, composed by five undergraduate research team, research and development of ***universal steel mill design and simulation study***, ***use ceramic furnace slag additive made steel composite***, respectively, getting the autonomous region of third prize students' science and technology innovation.

4.3.4 Computer Applications Combining with Teaching, Improve Students' Scientific Research Skills

In the process of teaching, pay attention to the computer in material processing field application example is introduced to classroom teaching, combining scientific research project in new theories, new technology, extend students' teaching knowledge.

4.3.5 Strengthening the Teaching Practice, Set Up the Class Paper Link and Train Students' Project Consciousness and Thinking Habits

Paper courses, school courses 2-3 weeks, attracting students to participate in project design and practice. To provide students with the right guidance, the cultivation of the students' practical engineering awareness and thinking habits.

The students of our material molding in teaching practice, all arranged for 2 weeks of course work time for class paper.

5 To Meet the Needs of Society, Promote the Teaching Reform of Graduates

5.1 According to the Student Employment, Implement the Order Training Mode

In view of college teaching management system was subordinate to the steel metallurgical industry, their actively using this natural ties of ordering cultured pilot; in addition, initiatively aimed at the market demand, institute of the teaching reform according to the employing needs , including implement professional setting, curriculum arranging, teaching content, graduation practice and graduation design content, the form and method of teaching and so on various aspects of adjustment, adapted to the enterprise technical post's needs of technology, process and skills to sexual specialized talents, such as: shaping 2000 grade, 2003 grade part students, according to own the employment requirements,make an agreement with the employing unit, during the graduation practice, to the employing units to practice, graduate on jobs can enter professional environment soon after, adapt to the technical requirement, secure jobs, employing unit is very welcome such orders cultivation mode. Graduation thesis topic determination, the student population proportion for writing papers all can according to the student employment the requirement of the unit and the actual situation of teachers to determine.

5.2 Pushing Graduation Design (Graduation Thesis), Combination of Practice Training and Employment

Prevenient graduation design, the content and the method should be gradually instead by combination of graduation thesis, practice training and employment, "three-in-one" means replaced. Graduation design and graduation thesis link should combine factory, deeply the enterprise actually go on, and the training before taking up their jobs, graduation practice time can determine for 3 ~ 4 weeks. Enterprise through this link, understand the graduates and as enterprise receiving process.

5.3 To Meet the Needs of Society, Broaden the Channels, Expand Graduate Employment Domain

With the economy and industrial structure adjustment's speed up, the pace of the employment of college graduates appears multi-layered trend. As to our graduates, toward the grassroots, towards production field, this should is necessary.

Survey results show that the main direction of graduates' employment is to the basic unit, in production, construction, management first; Jobs is mainly management and operation personnel aspects of production field of technology, process and design. Through the reform of course system, make the student to strengthen basic skill training, to improve the students' ability to solve practical problems; To further broaden students' professional knowledge and strengthen students' employment adaptive capacity, expand the graduates' employment field.

In recent years, material molding and control engineering through reform and practice, further improve the material molding and control engineering course system, made outstanding achievements. In 2005, ***metal material processing*** major won brand professional course of autonomous, in 2006, material plasticity engineering courses obtained the classics course of autonomous, use all sorts of autonomous means to improved students' comprehensive professional quality. Truly education project applied talent.

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Features, Training and Participation of National Computer Simulation Grand Prize

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Abstract. National Computer Simulation Grand Prize (NCSGP) is a national computer simulation contest sponsored by Higher Education Department of Ministry of Education P.R.C. which gaining more and more concern and participation in China. The paper analyzes the features and developments of NCSGP and summarized the relative experience of training and participation of Naval Aeronautical and Astronautical University. According to the characteristics of computer simulation, generic approaches of simulation and modeling were summarized as critical factors of students' knowledge and ability to be trained. The contents of training include programming skill, simulating methods, examples discussion and paper writing. And during the contest the participants choose the problem, collecting information and applying the training skills to complete the mission. A series of effective methods were formed gradually through the training process of National Computer Simulation Grand Prize. All the accumulated experience will make valuable contributions for the future contest.

Keywords: NCSGP, contest training and participating, competition training, innovative education.

1 Introduction

National Computer Simulation Grand Prize (NCSGP) is a national computer simulation contest sponsored by Higher Education Department of Ministry of Education. It is undertaken by Journal of Computer Simulation biennially since 2004. And the competition attracts not only diverse undergraduates, postgraduates but also the employed persons major in the simulation techniques from over hundred institutions around the nation. Now the result of the fourth preliminary contest has been announced from nearly thousand teams throughout the Nation [1]. Naval Aeronautical and Astronautical University (NAAU) has organized students to participate in all the four contests and accumulated a wealth of experience which is shared in the paper.

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2 Features of NCSGP

Like Mathematical Contest in Modeling (MCM) and ACM International Collegiate Programming Contest (ICPC) NCSGP attracts more and more students around the nation. All the three contests involve the computer programming but the emphases are different.

The National Computer Simulation Grand Prize is different. It requires not only a clear written expression, but also gives special emphasis on that computer simulation can be realized and can be repeated by the council. This requires that we must pay special attention to programming, particularly programming style, the normative, user-friendly interface, universality and the adaptability of simulation program.

2.1 Rules Analysis and Comparison of NCSGP

The MCM challenges teams of students to clarify, analyze, and propose solutions to open-ended problems drawn from all fields of science, business, and public policy in three days[2][3]. While during the ICPC contest, the teams are given 5 hours to solve between 8 and 12 programming problems which have the definite solutions [4]. The NCSGP challenges participants to solve the problems from engineering technology and scientific management in 15 days.

Similar to the MCM the NCSGP focuses on research, originality, communication and justification of results. Clear formulation, realizing and repeating of the computer simulation, the correct modelling and simulating result are the basic demands. And the NCSGP emphasizes the right answer using modeling and computer simulation which is different from MCM. And the more time gives the participants to build a more practical model and the simulation is a significant part of the competition which checks up the model.

The MCM and ICPC are team competitions. Current rules stipulate that each team consist of three students. While the NCSGP permits less than three persons to complete the mission so we can see some winner team with only one person. One point should be noticed that the participants needed to master the fundamental terms and conception of computer simulation and simulating techniques which should be presented correctly in the paper.

2.2 Achievements of NAAU

In 2004 NAAU organized several teams to participate the first NCSGP and only one team wined the third prize. In the second contest one team wined the first prize and one wined the second prize. In the third contest there are three teams wined respectively the first, second and third prize. And the team wined the first prize also got a first outstanding award in final contest. NAAU got top award for organization in third and fourth contests.

3 Training for NCSGP

Unlike the mature training for MCM and ICPC the training for NCSGP lack experience. And the strict criterion of simulation adds the training difficulty especially for undergraduates. And the faculty advisors of NAAU have been exploring the effective skills and we share them as following.

3.1 Lectures on Primary Knowledge

The theoretical components of computer simulation include similarity, simulating methodology, modeling, simulating system, simulating creditability and simulating application [5]. We encourage the students to give their own remarks on these theories in the paper.

3.2 Basic Steps Training in Modeling and Simulating

The theoretical components of computer simulation include similarity, simulating methodology, model, simulation system, simulating creditability and simulating application. We encourage the students to give their own remarks on these theories in the paper. Generally there are ten steps in modeling and simulating:

1) Proposing Problem

How to describe the problem, what is the respecting solution, and which part is to be simulated. Make it clear the goal and constraints. Define the objective function and controlled variables. System analysis, description of problem, definition and solution goals should be clear. Specify questions and the overall program. The contents of the simulation system to be expressed clearly; understand the purpose of simulation, the system boundary; determine the objective function and control variables; identify system entities, attributes and activities.

2) Modeling

Describe the problem in mathematical language. According to the problem and described, the system is abstracted to mathematical logic. Select the appropriate simulation methods (such as time step method, the event table method, etc.); to determine the initial state; design the whole system simulation flow chart.

3) Data Converting

Defining, identifying and collecting data.

4) Programming

Change the logical relationships to program statement. Describe the problem in mathematical language. Choose the appropriate simulating method. Design the system flow chart.

5) Verifying and Scheduling

Building up the relations between the model, realistic system and the relationship between the real system, the establishment of experimental conditions.

6) Testing

Define the running scheme including initial conditions, parameters, step size, and repeating times etc. Then input data and run the program to summarize the testing results such as data, tables and figures. Identify the specific running programs, such as initial conditions, parameters, step, repeat frequency, and input data, run the program. Implementation of simulation models, summarize the results, including data, tables, graphics.

7) Analyzing the Results

Design the appropriate forms of data output. The detailed list of files includes the important processing data. And the format helps the users to know about the whole process and analyze the data. We should analyze the problem amply to get the means to solve it and designing a clear structure for the simulation output. Output formats should be helpful for users to understand the whole process of simulation.

8) Modifying and Perfecting the Model

According to the results analyze, modify and perfect model. Then repeat the step 2~8 until to meet the demand and precision. Analysis based on the results, modify and improve the model, repeat the experiment. The simulation results will be obtained compared with the actual system, further analysis and improved model, until the line with the actual system requirements and accuracy so far.

9) Making Decision and Documenting

According to the results to make the decision and document the model.

10) System Maintaining

Debug and test all the programs to avoid errors before packaging. Then we can use simulation models or the results to form the final packaged procedures and maintenance.

3.3 Basic Programming

Although the computer languages are not limited we recommend programming in VC++ or MATLAB. VC++ has a friend GUI and C++ language is the required course in NAAU. MATLAB is easy to resolve the engineering problems and to cross the threshold for the students. If the graphical user interface is emphasized, VC++ is a good choice with the support of abundant libraries. The faculty advisors give a lecture on MATLAB for the interested students. As a tool for solving engineering problems, MATLAB should be the preferred programming language.

3.4 Material Collecting

The problem is described in no more than two sentences generally. The students should collect the relative information about the subject. The scientific management problems involve the current affairs such as subprime crisis, traffic jam, housing prices and so on which are unfamiliar not to both the students and the faculty advisors of NAAU.

Mastering the material collecting is the primary skill. Digesting and assimilating the abundant information is the next step. The problems appeared in the contest are often new relative to the major of these students. Innovation grows on the ground of fertile soil of predecessors' profound knowledge. We should use all means we can have to get useful information.

3.5 Cases Discussion

NCSGP is a new contest and the number of training problems is limited. Cases for discuss can be select0065d from previous contest problems and the similar MCM problems. The students at first were inspired to propose their own solutions which could be compared with the winning methods. And some problems would be tried by them after class. Cases discussion gives the students the vivid feelings about the real contest.

3.6 Paper Writing and Program Packaging

Participants are required to put together a well formed report on a complex topic in 15 days. In MCM even a brilliant team will not go far if they cannot convey their work effectively which is also true in NCSGP. The detailed tips for writing should be instructed including formulas displaying, good section headings, salient points, graphics labeling and so on. Let them have conclusions at the end of each section and make sure results are easy to find.

In NCSGP the submitting software is important the same as the final paper. And the careful error debugging is needed and the good looking GUI is recommended. To assure all the outputs are correct before packaging.

3.7 Language Expression Skills

Essential thesis requires students to have clear language ability, the ability to answer the question rationally, clearly and orderly. Optional papers generally focus on computer simulation modeling of the macro grasp. Simulation disciplines in understanding the basis of the basic situation, the light of reality, the application of discipline. Clear language ultimately derived from clear thinking. Language skills are only the final showcase.

4 Participation Experience

During the four organizations all the winning teams have well implemented the training skills into practice. And some merits needed are presented in the following part. Although the winners are little the most participants can learn more during the competition.

4.1 Team Cooperation

To complete a satisfying mission we advise the students to sign up in team. Each member of the three students has better the different major. To make the students grow up fast we encourage the graduates and the undergraduates in one team. Although the undergraduates are lack of skills in program and experience in writing they will learn from the graduates a lot in 15 days. And some undergraduates also have interest in MCM which is in good help. And the winners are not always the elder. Comparing to 3 days 15 days is a little longer which can well test the will and patience. A good team is never give up facing the difficulty and never satisfied until the deadline. And the experience will have a lifelong benefit.

Practice has proved that, in addition to the requirements of knowledge, the tacit understanding between team members is directly related to the success of the contest. When the progress is in trouble, the students should make full discussion on the subject. A consensus should be got out of differences of opinion, and once the direction is set, individuals must resolutely reject the direction of their own, then the strength of three people can thus be enlarged.

When the contest is in the middle and late procedures, each player should pay attention to their priorities: which one is responsible for writing papers, which one is responsible for solving the model, which one is responsible to continue to improve the models and procedures.

4.2 Strengthen the Power of Processing Details of Program, Documents and Hot Topics

When the main simulation has been complete, the residual procedures are program and document to be amended and improved, then we should pay attention to before and after the symbols are the same article, language is clear, layout is correct, whether the contents of the text are missing, etc.

Take a look at the subjects of computer simulation contest, every year one or two issues and social hot issues are closely linked, such as traffic congestion problems in 2008 and sub-prime crisis.

4.3 Final Contest Success

In the second contest we had one team to enter the final contest. Lacking the theoretical preparation the team got the forth place missing the outstanding award. And in the third contest we also had one team to enter the final contest. And this

time the participants grasped the opportunity very well and got the first place winning the highest outstanding award.

5 Conclusion

The paper analyzed the features of NCSGP comparing with the MCM and ICPC. Then the training content of NAAU before the NCSGP contests is shared including simulating theory and steps, material collecting, modeling, programming and writing. At last the participation experience is summarized.

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How to Improve the Teaching Effect of Material Mechanics

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Abstract. Material mechanics is an important specialized fundamental course of civil, machanical engineering and other professional engineering. Because it's systematic and knowledge, students generally think more difficult to learn, and are not interested in it. Through teaching practice, it is found that in boring mechanics knowledge interspersed with mechanical history, celebrity anecdotes and life examples, etc., can effective attract the students' attention, improving the teaching effect.

Keywords: Material mechanics, history of mechanics, celebrity anecdotes, engineering examples.

1 Introduction

Material mechanics is an important specialized fundamental course of civil, machanical engineering. According to the teaching program, students not only to master the basic concept and basic theory, but also can analysis and calculate some actual engineering problems correctly[1][2]. Because the mechanics of materials related to large concept and calculation, students generally think it is more boring and difficult to learn, no enthusiasm to learn it. In addition, it involve in the course of numerous formula deduction because the course itself according to the characteristics of textbooks arrangement. The students feel boring and absentminded in listioning. The teaching effect affect seriously. How to set up the material mechanics spoke interesting? -- The author in teaching process attempt does as follows, and good results were obtained.

2 Introduction the History of Mechanics Preparation

Most of us like listening to stories. In the teaching process, if it's appropriate, we can introduct some mechanical history story. The students often will immediately spirit and listen to with relish.

For example, in the problem of beams, we can relation with "ShangLiang" as big in folk building houses, must choose dexter days, the ceremony and the

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celebration held serious to ShangLiang, said the procedure extremely seriously, to illustrate the importance of beam of the structure. And then introduced the earliest system research in the book is Galileo beam published in1638- “About two foreign new scientist dialogue ", in this book, Galileo put forward concerning beam two respects: one is the strength of the cantilever beam, the other is the constant strength of beam under the action of weight. These two problems have been affected nearly 200 years later. Galileo didn't solve the problem him rosed correctly , and in discussion about cantilever beam strength, tensile stress in the cross section were though as the uniform distribution, and the neutral plane was in the underside of beam. But he also obtained some right conclusions. MaLve's in 1686 do experiments about beam actually. He thought that the stress is linear distribution along the beam height from below. MaLve's results progress than Galileo's, but it still not accurate. In 1678, Hook noted correctly that when beam bending, one side fiber is tensile and the other side is compressed, but unfortunately this thought no further. Until in 1694, Bernoulli caught main characteristics of beam and put forward the deformation plane section assumption, but still didn't resolve the problem. The reason was that he didn't jump out MaLve’s ideas, thoughing the position of neutral layer in the underside of beam. Until in 1826, France dynamicist Navier put forword neutral layer through shape heart of section, the problem of beam just correctly solved [3].

Combining with the history of mechanics progress, the student can understand the scientific development process in the relaxed atmosphere of listening to stories, and can realize the essence of the problem profoundly, increasing interest in mechanics and deepening impression in knowledges.

3 Thrust Celebrity Anecdotes

In the teaching process, in proper place, we can insert some famous anecdotes, which will rich mechanics teaching contents and attract the attention of students.

Such as the dynamicists whose head portrait was printed on the money has two, one was Newton, with his bust in 1 pound back ; Another was Euler, his head was printed in 10 Swiss francs positive [4]. Newton and Euler were, indeed, the two prominent mechanical history characters. Newton (1642-1727) in mechanics contribution headquarter, summarized the well-known three laws of motion and the law of universal gravitation, explained the celestial operation rules successly; Euler (1707-1782) was a prolific mathematician and dynamicists. He was a liberal of mechanical and in general mechanics, fluid mechanics and solid mechanics had made the fundamental work. The special also is his blindness in1766, but Euler still worked hard.

4 Ingenious Arrangement of Suspense

Before new teaching content, we can design issues according to the content, which will stimulate students' seeking knowledge desire, causes the student to go to the

lecture with doubt, attracting the attention of students, thus create active classroom atmosphere.

For instance in speak two-dimensional state of stress and pressure vessel problem, first proposed a problem: water pipe is frost cracking in winter, the crack is along the length direction of pipe or along the direction perpendicular to the length? Why is that? Let the student be doubt, with thinking to lectures. It is that circumferential stress is great than axial stress, so under internal pressure conduit role will along the axial craze.

And as in speak the stabilisation of compressive bar, first put forward a question: the agricultural production cultivation varieties of wheat choice which root system developed and shorter, why? Students at first listen to feel very confused, are there relation between agriculture and mechanics of materials? So students have questions in listening, and after class the answer will be found: That is plants reducing the length, root developed increasing constraints and reducing the soundness length factor μ, which reduce the soft of wheat straw, improving the wheat resistance instability ability. Wheat could increase production because of resistance to instability ability and not falling easily. Due to solve the actual problem, the student is very satisfying, more interest in learning.

5 Explain Life and Engineering Examples

Making theory and engineering example in life combined with together as far as possible will arouse student's interest.

For example, talking about bending deformation and bending stiffness concepts, we can such introduct a famous event: On July 17, 1981, there was a grand weekend party in a hyatt hotel, American Kansas city, suddenly the two and three floor of reinforced concrete built corridor fracture, falling dance floor, 113 people were batter to death, more than 200 people were wounded. The resion of this disaster was the chief designer on the design in order to pursue the open "beauty", no accorded to the structure design of mechanical experts on the second floor of the girders, but cancelled out some necessary column. So, the third floor slab lack of support, floor span is too big, on the third floor above objects gravity, third floor slab has been greatly sinking deformation, the tensile stress slab bottom than the reinforced concrete destruction tensile stress, floor fracturing collapsed. Through this event, natural introduces bending deformation and bending stiffness concept, explaining to bending deformation and the important significance of bending rigidity, but also improve the student's study of responsibility.

Talking about the bending strength calculation, we can speak our side examples: mechanics laboratory floor of a building in school, but because equipment renewal and the increase, the first floor can't accommodate, and it's plan to arrange rooms as experiment room in the second floor. The question is: Can we make a big universal pressure tester directly into the second floor room? If not, what calculations need to do? Then guides the student to analyze it is actually a strength check problems, how to calculate (concrete computational process is abbreviated). This problem will help students make associated with theory

knowledge and life reality, arouse students' interest, and improve students' ability to solve practical problems.

6 Summary

Through teaching practice, it is found that we interspersed with some mechanical history, celebrity anecdotes, life examples, and design some questions can effective attract the students' attention, improving the teaching effect.

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The Research of ERP Courses Teaching in Third-Batch Colleges

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Abstract. With the application of ERP system among a large number of firms, all kinds of colleges also begin to set up ERP courses. In order to adapt the teaching courses of Information Management and Computer majors in third-batch colleges better, this paper comes up with an ERP teaching system of theoretical study, practical teaching and certification training, based on the analysis of the feature of this course, and according to practical experience. Then schools can train practical talents to meet the needs of companies in a better way.

Keywords: ERP, third-batch College, practical teaching, certification training.

1 Introduction

Enterprise resource planning was proposed by Gartner Group Inc. of America in 90's of last century and accepted by enterprises around the world rapidly. Now, it is one of the modern enterprise management theories. ERP based on information technology and systematic management thinking, ERP provides management platform to run the means of decision-making for corporation, personnel and staff. At the same time, it is one of the most important tools of business process reengineering.

From Late 90s of last century, a number of institutions, researchers and enterprises have carried out a lot of research and practice on ERP. With the rapid development of information technology, changes of market environment and the promotion of "information technology to promote industrialization", which is proposed by government, many firms in our country have the requirement of application of ERP.

Thus, with the coming century of ERP, talents who have a good knowledge of ERP are badly in need. Colleges, especially third-batch colleges are setting up ERP courses to meet the urgent needs of our society. Nowadays, a lot of schools have courses about ERP. Also, a series of ERP experimental centers have been established. All the schools continue explore and improve the ERP system. Adding the ERP into teaching system of schools can narrow the distance between schools and the enterprises of application of ERP, and the companies of design, development and implementation of ERP. It is also contribute to the training of practical talents for companies.

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2 Teaching Features of ERP Courses in Third-Batch Colleges

ERP is a new course, which involves management science, computer science, information science, systematic science and others. The features of ERP are: extensive knowledge, integrated intensity and emphasizing the application of practical ability. The focus of ERP differs according to the difference goals of majors, for example, economic management majors generally requires students to master the basic principles and theoretical methods of ERP, the process operations of enterprise and the application of software. For students whose major is information management, information system or computer, they have to master the basic data environment of the application of ERP, the business operations of enterprise, and related information technology. At the same time, they should have the abilities to analyze the design and the development of ERP system.

Aiming at students with different levels and majors, the education of ERP should emphasis different points, of which main task is to let students have the knowledge of ERP background and evolution; master the concept of ERP and its component; grasp the basic data environment of the application of ERP; project management, material management, workshop process management and purchase process management; calculate the cost of products accurately; apply ERP and design and develop ERP system.

Based on the features of third-patch colleges, the teaching of ERP should have the features as follows:

- The Integration of Theories
  ERP is a new integrated course. It involves management science, computer science, information science systematic science and others. So it requires students full of knowledge in management theories, computer skills and other related knowledge before they study this course. Meanwhile, because ERP system involves the whole process of business operation, students are required to know the operation management and financial management of companies before they start to learn this course. Otherwise, students would not understand the basic theory of ERP taught by professors. In the end, students would lose their interests, which will have a bad effect on teaching.
- The Same Importance of Theory and Practice
  The final goal of ERP courses for students whose majors are information management, information system and computer is to help students understand the process of operation management in companies, know the practical operation of ERP system well, grasp the basic design and development method of ERP system, and master implement method of ERP system. If teachers just pay attention to teach students theoretical knowledge, students will be lack of practical experience and deep understanding of ERP system. Then it will be hard for students to understand and master ERP system.

3 Existing Problems

From the development history of ERP at home and aboard or the time of setting up ERP courses in third-patch colleges, ERP courses are new and being developed and improved. At present, the means and level of teaching in third-patch colleges are discordant. Although some colleges have made good progress in teaching ERP courses by the way of cooperation between schools and companies, construction of practicing base and teaching openly, the teaching of ERP in most schools are just in the level of traditional theoretical teaching, demonstration of software operation and analysis of cases. In generally, the problems existing in ERP courses teaching at present are as flows:

- Weak Teaching Capability of Teachers
  The characteristics of the course of ERP require teachers to not only have a wealth of management knowledge, but also a wealth of information and technical knowledge, they would better also have some business practice experience. At present, the vast majority of the teachers teaching ERP were majoring in other majors (such as: business management, financial management, marketing, etc.), and many teachers are directly engaged in teaching after graduation from the University .They are lack of business practices experience.
- Rich Teaching Contents, But Limited Hours.
  ERP programs not only theoretically lecture to students of various departments and other aspects of the business methods and management methods by decision-making, management and operational level, but also teach theory of software to resolve technical solutions and operational processes from the practical aspect. Because of the curriculum and the total credit requirements, many three institutions only set 64 or 48 hours of teaching time for the ERP program, some universities even set only 32 hours for teaching ERP. Instructors just teach part of the ERP knowledge which they are more familiar with. They cannot teach ERP course systematically and comprehensively
- Difficult to Establish the Experimental Platform
  The characteristics of the ERP course decided its importance to integrate theory with practical application, while it is far beyond the reach of many third-tier colleges and university domestically due to the huge cost. The average expenses for establishing an experimental platform are more than hundreds of thousand even millions RMB. Beside the expenses, training, service and safety are also limits to the establishment of the experimental platform in the cooperation of colleges and corporations.

4 The Design of ERP Courses System

Combined years of experience of ERP development and implement of teachers in our school with years of practice of teaching, they come up with a series of ERP courses system suitable to students whose major are information management and information system, as Figure 1 shows.

According to the features of our courses and the situation of employment, students are working in the field of management application, management consultation, and development of software system and so on. So we focus on theoretical teaching, practical teaching and certification training in the teaching process according to different objective of employment.

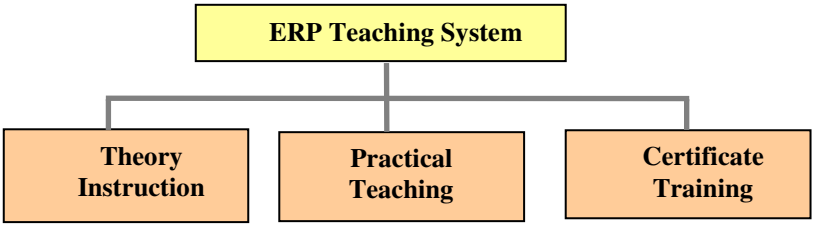

Fig. 1. ERP courses system

4.1 Theory Teaching

The core of Theory Teaching is to instruct in some basic theories, principle and methods about ERP, during the teaching process students are able to get familiar with ERP's basic knowledge. With the form of Case-study in ERP, students could learn to analyze the routine operations of each department in the organization

There are three kinds of teaching form of Theory Teaching. They are mentioned followed:

●Keynotes instruction. Select the main points in each chapter and make a detailed explanation on them.
●Case study of keynotes. Combine the theory instruction of keynotes with cases analysis, by which students will be encouraged to take part in the study and practice the skills they have learned.
●Group discussion. Teachers introduce some existing problems in the operation of business management. Students are divided into several groups. Each group needs to offer a solution through discussion and present it to the class. Teachers will give a comment to each group's solution in the end of their presentation.

The contents of ERP instruction are listed in the table 1. With different needs of fields and trainings, the teaching concept and keynotes of ERP can be adjusted to fit the specific conditions.

4.2 Practical Teaching

Practical teaching has two teaching contents: Simulation Sand Table Training and software simulation training.

ERP Simulation Sand Table Training Course is a designed experimental platform to experience the role of experimental platform for the enterprise resource planning system. The material object Sand Table is used to display internal and external resources of enterprises intuitively and vividly. At present, the

information management & information systems department and computer department have opened ERP Sand Table courses, which will be used as leading courses of ERP principles after the finishing of some foundation courses. This goal will be achieved through a series of experimental link such as student participation, sand table carrier, and stimulation management, simulated against drill, instructor, and student's perception sharing, and so on. This idea is to mix theory and practice as one, to set the role play and posts experience at a suit. After a series of activities in market analysis, formulating strategy, marketing planning, organizing production, financial management, students get to comprehend the scientific management rule, cultivate teamwork and comprehensively promote management ability. It is also a practical experience on enterprise resource management process.

Table 1. Content of ERP Teaching

Content	Keynote	Way
The formation and Development of ERP	·The Theory Forming Process ·ERP in China	Lecture
Basic Concept	BOM, Item Code, Process Flow, Work Center, etc	Lecture
Sales Management	The Compilation, Control and Evaluation of Sales Plan	Lecture
Master Production Schedule (MPS)	·Planning Horizon ·MPS Calculation	Lecture
Materials Requirement Planning (MRP)	The Computing Process and Algorithm of MRP	Lecture
Capacity Requirement Planning (CRP)	The Compilation, Analysis and Control of CRP	Lecture
Shop Floor Management	The Compilation, Monitor and Control of Operation Schedule	Lecture
Purchasing Management	The Purchasing Circuit and its Monitor	Lecture
Inventory Management	The Control Methods and Manage Strategy of IM	Lecture
Costs Management	Costs Accounting	Lecture
Financial Management	General Ledger, Current Account, Financial Analysis	Lecture
ERP Implementation and Evaluation	·Implement Instruction ·Business Process Reengineering (BPR)	Lecture & Case-Study
Design of ERP System	Methods and Tools	Lecture & Case-Study

Software simulation training course is to make students understand and know ERP software, familiar with ERP system function, grasp the ERP system processes and specific software operation methods, improve the student practice ability and enterprise actual combat skills after mastering the ERP principle and method during teaching process, as well as by using YFIDA ERP with U8 demo account to cover and simulation data on the enterprise's management to simulate the process.

It is also used to make students to truly feel ERP systemic and its application value.

4.3 The Authentication Training

Authentication training will be finished at the evaluation base established by our school and NTC national networks and information NTC (National Network and Information training and Examination Management Center) .These courses are designed according to professional characteristics and authentication training content, formulated NTC authentication training both factions of the teachers completed link. We encourage students to participate in the NTC ERP management division qualification authentication.

The above ERP teaching courses form the teaching system. the theoretical teaching purpose is to let students to master the basic principles and ideas ERP; The practice teaching purpose is to let students understand the ERP system, systemic and application value; The certification training purpose is to let a student ascending ERP application experience, knowing the ERP development trend and get ahead of business operation experience. The three teaching effects of different, complementary division form a complete ERP teaching system and ERP talent cultivation system.

5 Summaries

City College of Xi'an Jiaotong University is targeted to cultivate talents, so, the curriculum of ERP is determined to teach application talents on the target. After years of teaching and practice, driven by the school-enterprise cooperation is proposed based on theoretical study and practice teaching, certification training for the integration of ERP course teaching system.

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Analysis on Factors of Regional Logistics of China – ASEAN: BASED on the Angle of the Gravity Model

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Abstract. The economic cooperation between China and ASEAN has developed numerous regional logistics activities since 2002. Logistics is the basis for economic cooperation; the free logistics activity is one of the prerequisites for enhancing cooperation between countries or regions. What are the main factors which have influenced the regional logistics activities? How to improve these factors to get these logistics activities in harmony? These issues are urgent for China and ASEAN as well. This thesis constructed an expansive gravity model and used it to study the major influencing factors of regional logistics of China - ASEAN. The results show that: GDP of China and ASEAN countries; output value of transportation, storage and post and telecommunications industry; cargo volume; product mix, as well as the distance between China and ASEAN countries, respectively have an impact of various degrees on regional logistics volume of China - ASEAN.

Keywords: Regional Logistics, Influencing Factors, Gravity Model.

1 Introduction

ASEAN is not only China's important neighbor, but also interdependent trading partner. In recent years, the import and export trade and volume between China - ASEAN have got a fast growth because of the further cooperation in China - ASEAN regional economic and trade. The exports of China's goods to ASEAN have been reached 138.2 billion U.S. dollars in 2010, have an increase of 30.1% over the previous year; the imports of China's goods from ASEAN have been up to 154.6 billion U.S. dollars, have an increase of 44.8% over the previous year. At the same time, ASEAN's imports and exports accounted for a relatively large proportion of China's imports and exports. In 2010, the trade volume between China and ASEAN have been reached 292.8 billion U.S. dollars and accounted for 9.85% of China's total imports and exports of goods ($ 2,972,800,000,000). ASEAN has become China's fourth largest trading partner. Because of the

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development of trade and other aspects cooperation between China and ASEAN, the logistics needs between China and ASEAN is increasing. The scholars and government of China and ASEAN countries need to focus on the following issues: what are the influencing factors of China - ASEAN regional logistics? How to improve logistics efficiency, reduce logistics costs, expand profit margins and enhance the core competitiveness of products between regions by improving these factors?

2 Introduction of the Gravity Model

Gravity model of trade originated from the law of universal gravitation of Newton. The gravity model was first applied to the field of international trade by Tinbergen (1962) and Poyhonen (1963). Their study pointed out that the scale of bilateral trade flows between two countries has a positively proportional to their respective total economy and has an inversely proportional to the distance between them.

The basic form of Gravity Model is:

$$Xij=A(YiYj)/Dij\ . \tag{1}$$

X_{ij}—the exports volume of Country i to Country j;A—constant;Y_i—the GDP of Country i; Y_j—the GDP of Country j;D_{ij}—the distance between Country i and j, usually represented by the distance between Capital or economic center of the two countries.

In order to meet the needs of linear estimation and eliminate the impact of heteroscedasticity, we take the natural logarithm of both sides of formula(1):

$$\ln X_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + \mu_{ij}\ . \tag{2}$$

$\ln X_{ij}$, $\ln Y_i$, $\ln Y_j$ and $\ln D_{ij}$ is the natural logarithm of X_{ij}, Y_i, Y_j and D_{ij} respectively; β_0, β_1, β_2 and β_3 is regression coefficient; μ_{ij} is standard random error.

3 Model Construction and Data Sources

3.1 Model Construction

The Model in this paper used $\ln X_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + \mu_{ij}$ as the basic form, then added some new explanatory variables , extended and modified the basic model , finally built an extender Gravity Model. The extender Gravity Model is:

$$\ln X_{ij} = \beta_0 + \beta_1 \ln Y_i Y_j + \beta_2 \ln pc\, Y_i pc\, Y_j + \beta_3 \ln D_{ij} + \beta_4 \ln P_i P_j + \beta_5 \ln L_i L_j + \beta_6 (S) + \beta_7 (PC) + \mu_{ij}. \quad (3)$$

X_{ij}—the logistics volume between China and ASEAN, represented by the bilateral trade amounts of goods. The meaning of the explanatory variables, the expected symbol of the dependent variables and the explanation of theories are seeing in Table1.

Table 1. The meaning of the explanatory variables, the expected symbol of the dependent variables and the explanation of theories

explanatory variables	meaning	expected symbol	theory explanation
Y_i and Y_j [millions]	The GDP of China(I) and ASEAN(J)	+	Reflects the economic scale and logistics supply capacity of China and ASEAN.
pc Y_i and pc Y_j [USD]	China's/ ASEAN's per capita GDP	+	Represents the potential economic growth of China and ASEAN, it is proportional to logistics demand
D_{ij} [km]	The distance	-	Represents the costs of transportation. It has an inverse relationship with logistics volume
P_i and P_j [billion]	output value of transportation industry in china and ASEAN	+	Represents the overall level and speed of Chinese and ASEAN's logistics, the higher its value, the higher the development level of logistics
L_i[billion ton-km] and L_j[million ton-km]	The total cargo turnover of China and ASEAN	+	Represents the specific level of Chinese logistics and ASEAN's logistics.
S	standardization of logistics	+	If the degree of standardization are similar, taking the value "1", otherwise "0"
PC	Product structure	-	If the products structure are similar, taking the value "1", otherwise "0"

3.2 Data Sources

The data sources of each variable and sample are shown in Table2.

Table 2. Data sources

data	sources
Y_i and pc Y_i	China Statistical Yearbook 2010 http://www.stats.gov.cn/tjsj/ndsj/2010/indexch.htm
Y_j and pc Y_j	The website of ASEAN Secretariat http://www.aseansec.org
X_{ij} , P_i , L_i	China Statistical Yearbook 2002-2010 http://www.stats.gov.cn/tjsj/ndsj/
D_{ij}	www.indo.com http://www.indo.com/distance/index.html
P_j , L_j	United Nations database http://unstats.un.org/unsd/databases.htm

This article's regression testing is based on panel data; it not only includes the time-series data of 2004-2009, but also includes the cross-section data of each ASEAN countries and China. Sample size is 60.

4 Empirical Test and Correction

4.1 Empirical Results

The process of empirical test is as follows: first, take an overall regression analysis by Eviews 3.1 based on the above model, then remove some insignificant variables one by one, until all variables past the examination at the 0.05 significance level.

The preliminary regression results are shown in Table 3

Table 3. The preliminary regression results

variable	Regression coefficient	Standard deviation	T value
constant	8.582013	0.644456	13.31668
GDP	0.114816	0.039843	2.881707*
pc GDP	-0.252697	0.041883	-6.033344*
distance	-0.182144	0.059585	-3.056881*
output value of transportation	0.051463	0.008817	5.836587*
cargo turnover	0.988235	0.028615	34.53595*
standardization of logistics	0.005101	0.032495	0.156986
Product structure	-0.458189	0.091499	-5.007572*
F test value	3552.846	R^2	0.998394
DW value	0.626610	Adjusted R^2	0.998113

Note: *indicates the T value past the examination at the 1% significance level.

The regression results in Table 3 reflect that most of the expected symbols of the explanatory variables are consistent with expectations; they have a high significance and goodness of fit. It means that the Gravity Model can partly explain the logistics volume issues between China and ASEAN countries. However, there are also several questions existed in the regression results: First, the regression coefficient of similarity of Logistics Standardization (S) between China and ASEAN countries is very insignificant and the T value is very small. Meanwhile, the regression coefficient of the output value of transportation, storage and postal industry of China and ASEAN countries is insignificant too. Second, the symbols of the regression coefficient of per capita GDP of China and ASEAN countries(ln pc Yi pc Yj) does not match with the expected symbol, it means that the model may exist multicollinearity problems. In addition, the DW value of the regression results is low (0.626610), it means that the model may have autocorrelation problems.

4.2 Model Modification

For these reasons, we use "Backward Law" to screen the explanatory variables. At the same time, difference all the data in order to eliminate the autocorrelation problems. Accordingly, excluding the insignificant explanatory variables S and lnpc Y_i pc Y_j,the regression results of revised model are shown in Table 4.

Table 4. The regression results of revised model

variable	Regression coefficient	Standard deviation	T value
constant	6.021551	0.228380	4.51267
GDP	0.328099	0.079325	4.136149*
distance	-0.494244	0.027351	-3.692633*
output value of transportation	0.205164	0.050504	4.062372*
cargo turnover	0.987773	0.019137	51.61486*
standardization of logistics	-0.122426	0.016332	-1.973127**
F test value	562.5077	R^2	0.985287
DW value	2.096015	Adjusted R^2	0.983535

Note: *indicates the T value past the examination at the 1% significance level.
** indicates the T value past the examination at the 5% significance level.

The regression results in Table 4 show that the regression results have been greatly improved by excluding the explanatory variables S and lnpc Y_i pc Y_j. The symbols of the variable coefficient are consistent with the expected symbols. The goodness of fit of the model and the adjusted R^2 are both above 0.98, it indicates that the model has a good goodness of fit. The equation has past the F test; it indicates that there is a strong linear relationship between the variables and explanatory variables. The T value of most of the explanation variables is increased and all

in line with the 5% significance level. Meanwhile, the DW value (2.096015) of the regression results is also increased (close to 2), indicating that autocorrelation problems have been well improved in the modified model.

5 Analysis of Model Results

The results of the modified Gravity Model show that:

(1) The main influencing factors of regional logistics of China – ASEAN are GDP of China and ASEAN countries(Y), output value of transportation, storage and post and telecommunications industry(P), cargo turnover(L), Product structure(PC) and the distance between China and ASEAN countries(D_{ij}). The descending order is L, D_{ij}, Y, P and PC.

(2)The most important factor of bilateral logistics volume is the cargo turnover volume and capacity (L) of China and ASEAN countries. The impact is greater than their GDP's (Y). In the case of other conditions remain unchanged; the bilateral logistics volume can increased by 0.987773% when (L) increased by 1%. This reflects that the improvements of the overall ability of logistics between China and ASEAN countries can play an important role in the development of supply capacity of logistics; it has a positive role on logistics coordination between China and ASEAN countries.

(3) The distance between China and ASEAN countries (Dij) is a "resistance factor" in the model. Usually, the greater the distance is, the higher the transport costs; and the greater the cultural differences, the more difficulties in information exchange. The great distance will block bilateral logistics activities and logistics coordination. Conversely, the smaller the distance is, the smaller obstacles the bilateral logistics activities and coordination will have. As shown in this Model, In the case of other conditions remain unchanged, the bilateral logistics volume can decreased by 0.494244% when the absolute distance increased by 1%.

(4) The GDP of China and ASEAN countries is one of the important factors too. In the case of other conditions remain unchanged; the bilateral logistics volume can increased by 0.328099% when GDP increased by 1%. This reflects that the level of the national GDP can reflect one country's economic size and the overall capacity of the logistics supply. The greater the economic of scale is, the stronger the logistics supply capacity and the better to the logistics coordination.

(5) The degree of influence of the output value of transportation, storage and postal industry of China and ASEAN countries is relatively small. In the case of other conditions remain unchanged; the bilateral logistics volume can increase by 0.205164% when the output value of transportation, storage and postal industry (P) increased by 1%. This is because the logistics activities between China and ASEAN countries take a low proportion in their countries and the development of the two in transports, storage and postal industry is not very balanced.

(6) The difference of product structures (PC) between China and ASEAN countries is a "resistance factor" too. In the case of other conditions remain unchanged; the bilateral logistics volume can decreased by 0.122426% when the similarities of product structure increased by 1%. The more similar the product mix, the smaller demand the both sides have, the less possibility of trade and the less bilateral logistics.

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Construction of Comprehensive Experiment Platform of Mechanical Major

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Abstract. The traditional experiment teaching system of mechanical major has a lot of shortages, such as fewer class hours and fewer experiment types. Therefore, it has become a key point in the reformation of education at present. The reformational target is to construct a comprehensive experiment platform of mechanical major as the main part of experiment teaching, to promote updating the experiment content through creation of experiment, to build experiment teaching system of "three platforms, three levels, modularization and open type". Laboratory facilities are innovated by means of students' directing or participating in scientific research items and introduction of advanced technology. The comprehensive experiment platform has benefited to a large number of students of some majors including mechanical manufacture and automation, vehicle engineering, electric work and automation, industrial automation. Some teaching achievement awards are obtained. Scientific research atmosphere of students is animated.

Keywords: mechanical major, comprehensive experiment platform, teaching system.

1 Introduction

Mechanical major is very important in some comprehensive university. In order to entirely propel quality-oriented education and to improve personnel training quality, the construction of experiment teaching system has become a key point in education reform. Experiment teaching is aimed at training students' primary experiment capacity and scientific research method, improving their scientific literacy, cultivating their creative spirit and thought. It is a pivotal role in innovating personnel training in universities [1-4].

2 The Shortage of Traditional Experiment Teaching System

As a whole, experiment teaching system of mechanical curriculum in engineering universities in our country is attached to the teaching of theory curriculum until now. It does not have independent and integrated experiment system. The experiment class hour is lacking. The experiment types are simplex. The experiment

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content is old-fashioned. The independence and level setting of experiment have no way of handling. Because of the influence of traditional experiment environment and organization way, the special management and purpose of instruments and equipments immensely restrict the sharing of experiment resources. It goes against developing of comprehensive, zetetic and researchful experiment. It also goes against students' improving in comprehensive quality and practical ability.

Under the guidance of experiment teaching idea of valuing theory and lighting practice, the interaction between teachers and students in the course of experiment is lacking [2-4]. The students undergo training passively. The model of experiment teaching is difficult to give full play to students' positivity, initiative and creation. It goes against students' bardian development. It is hard to put into effect the policy of teaching students in accordance of their aptitude. Therefore, a new model of experiment teaching is necessary to adapt to new situations [3-5].

3 The Target of Constructing Comprehensive Experiment Platform of Mechanical Major

3.1 The Comprehensive Experiment Platform Serving as Main Body of Experiment Teaching of Mechanical Major

On the basis of cultivating scheme and teaching program of undergraduate course, the experiment system is reformed. According to the characteristics of mechanical major, a lot of behindhand equipments are being fallen into disuse. The comprehensive experiment platform of electromechanical system is forming gradually. The experiment teaching system is to hightlight the principal effect of comprehensive experiment. It is also to hightlight sharing, opening and efficiency. So it is more scientific and reasonable, and suitable for the experiment teaching requirement in the new situations. The immediate term objective is to integrate experiment resources to form a comprehensive experiment platform uniformly and orderly to reach the standard of Ministry of Education. The future objective is to apply for provincial teaching award, furthermore, to apply for provincial practical base for innovative education engineering.

3.2 Updating the Experiment Content through Creation

There are two ways to update the experiment content through creation. One is that some experiment contents involved with innovation ability training, such as modeling, simulation, design and manufacturing, are enriched into the existing experiments. Another is that students are allowed to participate in scientific research item to improve their innovative ability. Through using advanced experiment equipment in scientific research, students have come into contact with advanced technologies on the world. All these help to broaden their outlook, to open mentality, to growth experience. The students will have more interest to design comprehensive experiments.

4 Construction of the Teaching System of Mechanical Experiment Curriculum

The experiments of mechanical major cover main courses of mechanical engineering major or majors similar to mechanical engineering, such as engineering material, machine design, principle of machinery, interchangeability and technical measurement, mechanical manufacturing technology, technology of metals, innovation design of machine, etc. They are involved with some subjects, such as mechanical engineering and material engineering. The coverage is wide. The contents are a lot. The laboratory facilities are a lot. Therefore, the experiment teaching system must be reformed. It is showed in Fig.1.

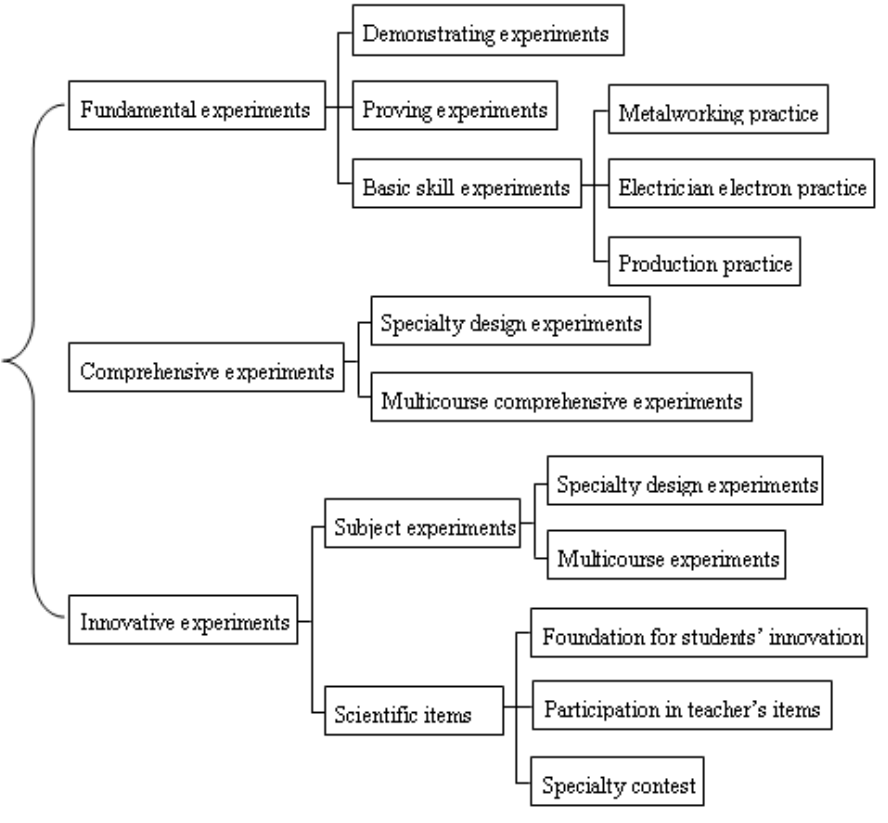

Fig. 1. Composition of the experiment teaching system

By means of in-depth analysis, an experiment teaching system, "three platform, three levels, modularization, open type", is constructed. Its constructing thought is that the subject is as the basis of the system. It emphasizes the fusion of subjects and the sharing of resources. The experiments are striped from theory courses to

become an independent course. So the innovative circumstance is built. The number of old-fashioned experiments decreases. The number of scheming, comprehensive or innovative experiments increases. Students are advocated to participate in teacher's scientific items. The integration of experiment teaching and scientific research is emphasized. The functional orientation reflects the unitarity between personnel training and scientific research.

The three platforms are machinery foundation experiment platform, mechanical engineering training platform and research or innovative design platform. All kinds of experiments are arranged step by step in each platform according to their characteristics. The multilevel experiment teaching system has formed.

The three levels are fundamental experiments, comprehensive experiments and innovative experiments. The fundamental experiments are a series of basic experiments of machinery foundation and basic skill experiments. Their target is to improve students' basic quality and to enhance their practical ability. The comprehensive experiments are set up after students have had basic theory and practical foundation. These experiments emphasize students' design of experiment and developing ability. They help to promote student's question-raising and question-solving ability. Furthermore, they can arouse student's positivity of self-directed learning and innovative design. The innovative experiments emphasize students' initiative and creation. Students can decide experiment topic, design experiment way and select experiment principle by themselves. The innovative experiments include scientific items, participation in teachers' items and all kinds of contests.

Each platform is composed of a series of experiments. These experiments are divided into several teaching modules according to different major and teaching requirement. Different major can choose different module.

All experiments are open to all students. The experiment teaching is made to be a platform for students' individual training and free development.

5 Achievements Since the Construction of Comprehensive Experiment Platform

Through intersection of machinery, electronics and computer application, the comprehensive experiment platform fully shows a lot of advantages in terms of students' practical ability. It provides an innovative educational practical base for quality-oriented education and "3+1" teaching reform.

The comprehensive experiment platform benefits a lot of majors, such as mechanical engineering, industrial engineering and industry automation. It improves quite a few students' practical ability in our school. It makes the experiment teaching of mechanical major to reach a higher stage. By means of the platform, we have obtained three national awards and five provincial awards. We have applied fifteen items of student innovational fund.

6 Conclusions

Multilevel, open and research-based experiment teaching system has built. It aims at students' innovative consciousness and ability. It has improved students' basic quality. It has promoted the major and subject construction. It has brought about a lot of honours for us.

The reform of the experiment teaching system is an arduous task with a long period. We will positively explore its inner law and constantly perfect it.

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Comparison and Analysis on Education System of Practical Talents of China and Germany

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Abstract. The paper made comparison and analysis on education system, teaching model and conditions system of Chinese and German practical talents in the view of systemic research, specially put emphasis and research on German FH experiences and current Chinese higher vocational education system and "1221" teaching model, and indicates that Chinese practical talents education system need references from German practical talents education experiences based on integrated arrangement and top layout design, and need construct the education system from middle, junior college graduate to undergraduate and postgraduate with combination of application technology talents and practical talents, and need set up cross-bridge of higher vocational talents education and degree system from junior college graduate stage to undergraduate and postgraduate stage in order to realize the breakthrough of education arrangement system and running system and be adapted to the social practice of public higher vocational education and invented industrial development.

Keywords: China and Germany, Practical talents, Comparison research.

1 Preface

Overview to the development conditions of practical talents education all over the countries, Germany is exactly a successful demo. In the late sixties and early seventies of last century Germany built up Fachhochschule (FH) as successful invention of higher practical talents education model which is looked as secrete weapon to be strong industrial and economic country after wars. Thus it is necessary for our country and our modernization development to realize and study the features of German practical talents, introduce the German advanced teaching theory and practices for our practical talents, special in higher vocational college and practical college, education and positioning based on the practical talents education system.

2 Talents Education System

2.1 German Practical Talents Education System

German practical talents education system as Figure 1[1].FH is at the top in the sys-tem of which basic teaching task is to apply practical teaching in the students

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for fu-ture professional life. FH is similar as the higher vocational college, or higher train-ing school, even practical college in China. Before 30 years, FH is similar as higher training school, and after many years development it is more similar as practical col-lege in China which educates higher level practical talents. FH has following features:

① Belonging to vocational education after high school;
② Belonging to higher level of vocational education;
③ Belonging to practical talents education for productions;
④ Belonging to position vocational education which emphasize practice including formal education record and informal education;
⑤ Depending on industrial development requirement;

Higher vocational education series without formal record Higher vocational education series with formal record

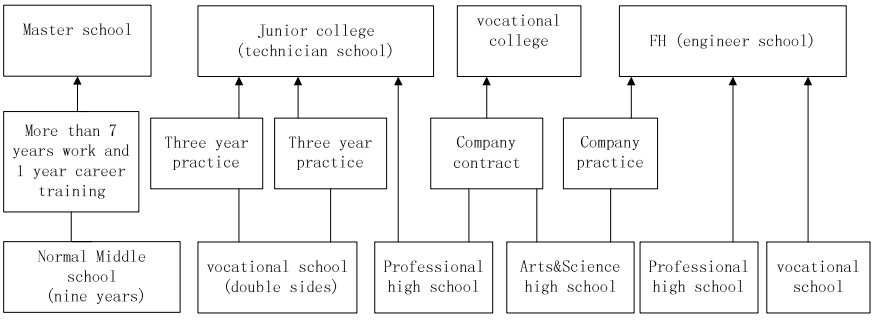

Fig. 1. German practical talents education system

2.2 Chinese Practical Talents Education System

There is no similar practical talents education system in China. Though in China higher vocational education is one type of higher education system, its application is currently designed two or three year education. Normal practical college in China is a new developing college education which is upgraded from the higher vocational college after 2000 year and its talents education system is not completed and need foreign advanced experiences. So some researchers suggested that degree system of higher vocational education and connections to other education system could be layout as Figure 2 [2].

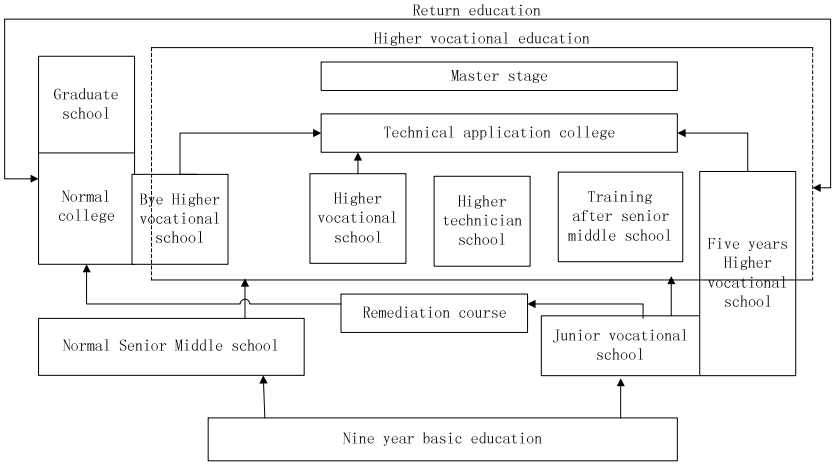

Fig. 2. Chinese higher vocational education system

2.3 Comparison and Analysis on Education System of Practical Talents of China and Germany

China should immediately select qualified vocational schools for testing to upgrade into college to actively explore the multi-running ways of higher vocational education, set up practical talents education system with integrated layout and fluent connections to other educations, and form complete practical talents education chain from junior lever to higher level, in order to discover the modern vocational education system and degree system with Chinese features based on national higher vocational schools and Germany FH experiences. China should actively practice lifelong education philosophy, carry out both formal school record education and technical training education, and be trying to build overpass bridge of higher vocational education and normal college education for discovery of front-vocational education and post-vocational education, vocational education and other education.

3 Teaching Model

3.1 German FH Teaching Model

With practical talents education aim FH features to integrate the theory with practices during its 30 years development, and FH realizes three into one of " overall teaching, project development and application research ", and connections among the three is the teaching model of integration of industry, education and academy[3]. It is reflected in:

(1) FH does the overall design of theory teaching and practice teaching, theory teaching has clear practical intend and does not emphasize the systemic and abstract of discipline knowledge, does not concentrate on theory analysis, but emphasize application in production and other areas of science knowledge and ways, focus on specialty knowledge connecting to practice, and FH is used to carrying out module teaching[4].Module teaching reform solves the systematic problem of course setting, deals with the connection ways of theory teaching and practice teaching, and it is most critical to combine the specialty teaching with quality education through graduation project and practicing in company.

(2) FH concentrates on practical teaching. Practical teaching includes experiments teaching, practicing teaching, project teaching, graduation project and academic travel (Exkursion). Practical teaching is the key point of FH, specially highlight on one se-mester practicing in company and one semester academic travel (Exkursion). FH em-phasizes on project development and application research, integrates teaching, resea-rch and social services into one.

(3) FH emphasizes relationship with society and integration of industry, education and academy, and companies supports the teaching staff development and join in teaching contents setting including laboratory development.

3.2 Chinese Higher Vocational Teaching Model

The development of Chinese higher vocational education experiences two stages: from 1999 to 2005 is the higher vocational schools construction stage; from 2006 to 2010 is the reforming, featuring and quality improving stage pushed by higher vocational schools demo activities and specialty promoting activities. During fist stage the most important achievements is to explore a new development model of higher vocational education with Chinese features which highlights in cooperation of industry and education, integration of practicing and teaching, that is “1221” model concentrating on practical ability education[5]:

The first “1” represents one management platform under cooperation between school and company.

The first “2” means two systems including construction of practical courses and basic courses. Practical courses system aims at forming student practicing ability and basic courses system aims at forming student self-developing ability based on basic knowledge. The two systems should be applied flexibly and crossly.

The second “2” means two certificates including college graduation certificate and national career qualification certificates. Two certificates are necessary for proving students ability, one is formal school record and the other is career qualification certificate, that reflect students both knowledge level and practicing level.

The second “1” means one lifelong education base. Higher vocational schools should be both lifelong education base and training service base for society.

3.3 Comparison and Analysis on Higher Vocational Courses and Teaching System of China and Germany

Teaching model of China and Germany both emphasizes the integration of industry, education, academy, but practical talents education system in FH looks more complete, reasonable, effective and solves all kinds of problems during talents education better, such as integration of teaching, research, social services and combination of theory teaching and practicing teaching, specialty teaching and quality education., and FH receives better supports from companies, which could be references to China for systematic solution plan, specially the combination of courses system and teaching contents.

4 Teaching Conditions System

High level teaching conditions system for practical talents includes five important fac-tors of teaching staff with solid technical knowledge and double qualification certifi-cate, enrollment students with practical experiences, practical training base with fully necessary equipments, practical projects from real work and simulated practical teaching environment.

4.1 German FH Teaching Conditions System

Germany FH teaching conditions includes following points:

(1) Teaching staff conditions: Practicing features in FH is also applied in their tea-ching staff. Teachers in FH should have doctor degree and more than 5 years working experiences.

(2) Student enrollment conditions: Graduation from senior middle school and prac-tical experiences (pre-practicing).Enrollment conditions for new students in FH em-phasizes practical experiences, enrolled students are requested corresponding practical knowledge besides 12 years normal education.

(3) Project from real work: subject of project courses and Graduation project are fr-om companies which are closely related with production activities of companies.

(4) Practical training base construction including equipments and environments: Germany believes that it is not possible to educate practical talents if no existence of company environment. Training bases in FH are constructed same with the real prod-uction environment and equipments are from company sponsor or project products of teachers and students.

4.2 Chinese Teaching Conditions System

Comparing with German FH, there is big difference in China. For example, in Shenzhen Polytechnic most teachers are graduated undergraduates, masters, doctors or teachers from other colleges with no company working experiences; Students in Shenzhen Polytechnic are from senior middle school with no practical

experiences and only 10% of them are from vocational senior middle school with some practical experiences; student project is seldom from companies and mainly from invention working courses which aims improving students invention ability. Chinese most training base equipments in higher vocational schools are demo type and testing type, and production and research equipments is seldom due to money and development level.

5 Conclusions and Suggestions

Through comparison and analysis on education system of practical talents of China and Germany, the following conclusions and suggestions could be given as follows.

5.1 Chinese Practical Talents Education Should Be Integrated Arrangement and Top Layout Design

Chinese higher vocational education should not be no system, no integrated arrangement and top layout design, divide middle vocational education and higher vocational education, higher vocational education and technical application undergraduate even graduate education, and should discover multi-level practical talents education, set up practical talents education system (career type, technical application type, technical engineering type) , emphasize technical application and introduce FH experiences for high level technical application talents education, connect fluently middle vocational education, higher vocational education and technical application undergraduate and graduate education, build up complete modern vocational education system, robust higher vocational education degree system.

5.2 Teaching Model

Chinese higher vocational education should introduce FH experiences, make breakthrough on construction of teaching model and setting of practical teaching items, realize three factors into one of “integrated-teaching, project development, application research”. Chinese higher vocational education should make complete teaching design, apply credit system to school system, set stage teaching including basic stage and specialty stage, set coursed with modularization, combination, gradation, highlight technical application in teaching, enhance practicing arrangement including academic travel based on normal training, experiments, practicing, graduation project, add engineering and technical training projects which could come from company production activities, invention working projects, invention project courses, campus production training, special graduation project, graduation integrated training.. Chinese higher vocational education should establish technical consulting center, public technical service platform, arrange researching semester for professors, it could guarantee practical teaching system through series

technical application arrangements. Shenzhen Polytechnic has reformed on credit teaching system, invention project courses, graduation project and making active effect.

5.3 Teaching Conditions System

Chinese higher vocational education should improve teaching conditions greatly reg-arding to FH experiences and develop teaching staff, enrollment conditions, pro-jects, equipments and environment of training base, should deepen practical talents education model of "1221", build cooperation platform of "government, school, co-mpany, industry and four sides union motion" for talents teaching, and at the same time enhance practical teaching of high level technical application talents, construct complete practical teaching system of "production, education, invention, applica-tion".

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Research on the Construction of Specialized Teaching Team in Independent College Based on Symbiosis Theory

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Abstract. Independent colleges were established relying on the professional advantages of parent university and funds advantages of local investors, and had close symbiotic relationships with the parent university and local economy and society. Based on the symbiosis theory, this paper regarded all the cooperators of independent college's specialized teaching team as the ecological organic groups with complex correlation. The symbiotic system of specialized teaching team consists of symbiotic unit, symbiotic model and symbiotic environment. Symbiotic model is the key, symbiotic unit is the foundation, and symbiotic environment is the important external conditions. Then, this paper explained the reasons and operational model of symbiosis and sharing of specialized teaching team, and put forward the countermeasures of constructing secialized teaching team in independent college independent.

Keywords: symbiosis theory, specialized teaching team, independent college.

1 Introduction

The first independent colege of China is Zhejiang University City College who was established in 1999. At the end of 2009, there were 322 colleges taking a third of the undergraduate education mission. Independent colleges rely on the professional advantages of parent university and funds advantages of the local investors, and have close symbiotic relationships with the parent university and the local economy and society.

At present, the specialized teachers of independent college may generally be divided into two categories: (1) Full-time teacher. Part of full-time teachers came from the diversion of parent university. In general case, a number of older teachers or teachers with relative lower level were diverted to independent college, and excellent teachers would not be diverted to independent college. Another part of the full-time teachers came from recruitment. lots of graduate students were gradually recruited into independent college in recent years, who enriched the team of full-time teachers. Some retired professors were recruited as specialized teaching leaders. Independent colleges are vigorously introducing talents such as high-level academic leaders. But limited by concepts and systems, recruiting high-level

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telants has a certain degree of difficulty currently. Therefore, the age structure and professional title structure of the independent college teachers was showed as "dumbbell-shaped" lacking of a group of academic leaders and vigorous backbone teachers. (2) Part-time teachers. Part of full-time teachers of the parent university undertake part of the teaching task as part-time teachers of independent college. Some teachers in other university, retired teacher, and professionals and technician in enterprises and institutions are employed as part-time teachers of independent college. Because their principal work are not in independent college, they will not focus on the specialty construction of independent colleges.

With domestic student source reducing, independent colleges face a crisis of survival if they do not have specialty characteristics. In order to improve the quality of teaching and train qualified talents recognized by society, the establishment of specialized teaching team is an important organizational guarantee. Building specialized teaching team, on the one hand plays team strengths to carry out teaching research, promote educational reform, develop teaching resources, and better undertake the task of talent training task, on the other hand is an effective way to quickly enhance teachers' operational capacity and train backbone teachers. Based on the symbiosis theory, this paper regards all the cooperators of specialized teaching team in independent college as the ecological organic groups with complex correlation, analyzes the symbiotic unit, symbiotic model and symbiotic environment, and puts forward corresponding countermeasures.

2 Symbiotic Mechanism of Specialized Teaching Team in Independent Colleges

Symbiosis was originally derived from biological concept by the German biologist Anton deBarry (1879). He used it to explain the biological phenomenon of different species creatures living together. The phenomenon of specialized teaching team in independent college is similar to the biosphere in many ways. The symbiotic system of specialized teaching team in independent college is the interdependence formed by symbiotic units in certain symbiotic environment using certain symbiotic model, which includes three factors: symbiotic unit, symbiotic model and symbiotic environment (see figure 1). Those three symbiotic elements interact and effect each other, symbiotic model is the key, symbiotic unit is the foundation, and symbiotic environment is the important external conditions.

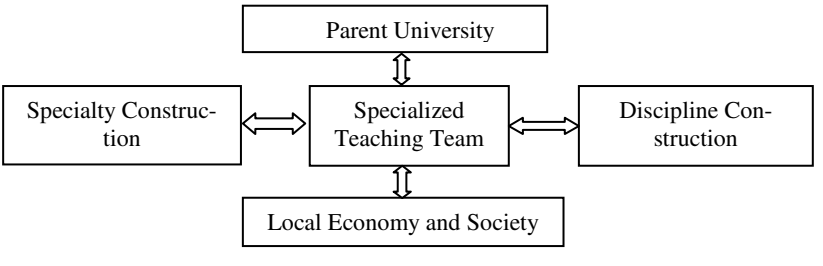

Fig. 1. Symbiotic system of specialized teaching team in independent college

2.1 Symbiotic Unit

There are various symbiotic units in the symbiosis system of specialized teaching team in independent college, such as full-time and part-time teachers, staff room in independent college and parent university, local enterprises and institutions, government and public sector out independent college. The interaction between symbiotic unit and the symbiotic evolution will promote the development of specialized teaching team in independent college.

2.2 Symbiotic Model

The behavioral pattern and the symbiotic degree of symbiotic units are combined to form a complete symbiotic model. From the view of behavior pattern, there are parasitic relationship, partial beneficial symbiotic relationship and mutually beneficial symbiotic relationship. From the view of organization, there are point symbiosis, intermittent symbiosis, continuous symbiosis and integrated symbiosis. At the beginning of the establishment of independent college, it was mainly attached to parent university. Parent university also expanded the enrollment and cultivated a lot of talents for society. This paper argues that the symbiotic model of specialized teaching team in independent college can be expressed with partial beneficial symbiotic relationship and mutually beneficial symbiotic relationship.

2.3 Symbiotic Environment

Symbiotic environment is formed with all of the factors beside the symbiotic units, including hard environment and soft environment. Hard environment includes laboratories, library, teaching facilities, and so on, while soft environment includes the factors of policy, the style of study, campus culture, as well as economic and social environment. These factors are interlinked and mutually influence each other, and influece the symbiont through the exchange of information, energy and material. One bottleneck in the development of specialized teaching team is policy.

3 Cause Analysis on the Symbiosis and Sharing of Specialized Teaching Team in Independent College

3.1 Symbiosis and Sharing of Specialized Teaching Team with Parent University

First, the specialty setup of independent college mainly relies on parent university, the model of management basically refers to parent university, and the training target trends to convergence. Parent university have mature specialty, strong teacher force, the better teaching and learning instruments and lab equipment, all of these are resources that independent college can use. Second, parent university provides professional guidance for specialized teaching team in independent

college. The foundation of independent college is often bad. Their specialized teaching ability need to be improved. The specialized teaching team can grow rapidly who are assisted by experienced teachers from parent university. Third, independent colleges provide a broad stage for the parent university enlarging enrollment. Independent colleges undertake one-third of the undergraduate training task, provide opportunities for parent universities to full use their resources, and provide new opportunities for teachers of parent universities to show their genius and pioneer innovation.

3.2 Symbiosis and Sharing of Specialized Teaching Team with Specialty and Discipline Construction

In the construction of independent college, the school will support the discipline construction and specialty construction. In discipline construction and specialty construction, higher requirement of teaching level will also be put forward. The core members of specialized teaching team are often the backbone of the specialty construction and discipline construction. Therefore, the construction of specilized teaching team and the construction of specialty and discipline are basically parallel in the independent college. The construction of specialty and discipline provide finance and talent support for the construction of specilized teaching team. The teaching achievements of specilized teaching team also provide the strong support for the construction of specialty and discipline.

3.3 Symbiosis and Sharing of Specialized Teaching Team with Local Economy and Society

First, the developments of local economy and society provide support for independent colleges. Local enterprises and institutions provide specialized teaching team in independent college with funds, laboratories and practice base, etc, also provide a vast space for the talents of teaching team to show their genius and pioneer innovation. In the process of forming teaching team, the local engineering technological talents, government officials, specialists and senior manager of companies might be directly absorbed to create a joint team together. Local economic and social developments lays a better foundation for attracting excellent teaching talents. Local government can directly incent the specialized teaching team by the way of innovative team support plan, all kinds of talents support plan etc. Government departments also can provide policy for high-level talent introduction, capital support for independent colleges, inject fresh blood into sepcialized teaching team, especially the introduction of team leader for the team's construction which will play a decisive role. Only the developments of local economy and society can provide them with capital, lab, scientific research projects, and so on.

Second, specialized teaching team can well train practical talents adapted to the needs of economic and social development. In fact, a large number of applied, complex and skilled talents with strong practice ability the are needed to develop local economy and society. The goal of independent college is just training those

applied talents. Facing local social and economic development, the local characteristics of the independent college are undoubtedly promoted. Team's excellent talents can become the think tank and consulting experts of government departments, provide relevant decision consultation for local government departments directly. Team's teaching and scientific research achievements can be converted into the realistic productive forces for the local economic and social development, and will directly promote the rapid development of economy and society.

4 Countermeasures of Specialized Teaching Team Construction of Independent College Based on Symbiosis Theory

4.1 Integrating Specialty and Discipline Resources of Independent College and Improve the Strength of Specialized Teaching Team

With a shorter history and limited resources, independent college should optimize the resource allocation and make full use of the resources of discipline construction and specialty construction, and improve the strength of specialized teaching team. First, make full use of the talent advantages in the construction of discipline and specialty. In the process of discipline construction and specialty construction, independent college often pay attention to the internal train and external gain of high-level talents, which could be shared.by the specialized teaching team. Second, Make full use of the resources of discipline construction such as funds, laboratories, books data, database etc, and all kinds of parent university's resources. Third, in the process of discipline construction and specialty construction, better innovation environment should be given to specialized teaching team, such as the reform of teaching mode, reform of teaching contents, and the reform of specialty setting, etc.

4.2 Strengthen the Share of Talents, Informations and Resources, and Form Strategic Alliances with Parent University

Specialized teaching team might form strategic alliance with parent university through various contracts. Accordiing to the locaition of strategic alliance in teaching chain, strategic alliance can be divided into two types: type of union and type of resource-deficiency supply. Union strategic alliance primarily reach cooperation with parent university in the education research and teaching reform, teaching mode reform and teaching contents reform and other aspects of teaching chain. All parties make full use of the alliance's comprehensive advantages of shared resources and coordination to achieve the optimal allocation of education and research and teaching reform. Resource-deficiency supply strategic alliance is

that excellent teachers of parent university will be absorbed as leaders or key members of teaching team in independent colleges to to make up their deficiencies.

4.3 Integrate into the Local Economic and Social Development, and Look for the "Coupling Point" of Symbiotic Development

The symbiotic development of independent colleges and local society and economy is based on the common interests. In order to fully realize their potential power, independent colleges should encourage teaching team members walk out of school and go deep into local social economic construction, and promote local social and economic development. They should turn into applied talents training base adapted to local economic and social needs, not lnly train large numbers of qualified graduates around the needs of the local economic and social development,but also train talents for local enterprise through academic lectures, short-term training, practicing and training base, training-orders etc. The symbiotic system should share library materials and experimental equipment inside area, establish human resources database to enforce talents exchange and cooperation, and turn into the center of local science and technology culture and talent exchange.

4.4 Independent Colleges, Government Departments and Ather Agencies Actively Promote the Formation of Positive Symbiotic Environment for the Teaching Team

Only the independent college vigorously give service to local economic and social development, local enterprises would have enthusiasm to participate in the construction of the independent college; conversely, only local enterprises support independent colleges of teaching and talent training, independent college would develop better and cultivate more talents, and give better service to local social and economic development. Colleges and government departments should actively formulate policies such as introducing talents, talent cultivation, achievement rewards etc, guide teaching team fast-growing, give priority to take care of In the calculation of teaching workload and performance evaluation. They should actively build teaching team with local enterprises and institutions, and share scientific innovation and technology development achievements.

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Optimal R&D Subsidies under Technology Licensing

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Abstract. An optimization model for government subsidies in a R&D race considering ex ante licensing as well as ex post licensing is proposed in this paper, under the assumption of a Bertrand duopoly with a linear demand function, and that the time required for a successful innovation is subject to Poisson distribution. The general market equilibriums are searched for by backward induction, followed with ex ante and ex post licensing equilibriums. Combined with the R&D race equilibrium analysis, the equilibrium net social welfare is optimized eventually. A numerical example is followed with the analysis about the effect of product differentiation on equilibrium consumer surplus and net social welfare. The model is proposed to be a theoretical reference for technology management strategy in reality.

Keywords: R&D race, subsidies, technology licensing, heterogeneous product.

1 Introduction

Government subsidies for R&D are intended to promote projects with high returns to society but too little private returns to be beneficial for private investors. R&D subsidies are an important tool to support technology policy in OECD countries. In 2005 roughly one third of funds for R&D are provided by the government [1]. To identify projects which are beneficial for society but need additional funds, some argues a crowding out effect may lead to subsidies for the "wrong" R&D projects [2], while more recent studies tend to deny crowding out effects [3].

Although the empirical literature is growing, theoretical papers are scarce. In a pioneer work, firms' investment incentives in oligopolies with spillovers are discussed [4]. Regarding the optimal subsidization in research markets, it is proved that it relies on the length of patent life, the character of innovation competition, and the extent of excess burdens associated with the generation of funds for subsidies [5].

So far few literatures feature both government R&D subsidies and technology licensing. This paper specially builds an optimization model of government subsidies in R&D race that integrates both ex ante and ex post licensing. We argue that

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many real-life government subsidies in R&D activities are similar to the situation described here. Our paper is related to some existing literature in treatment of technology licensing, which emphasizes the strategic choice among fixed-fee licensing, royalty licensing and fixed-fee plus royalty licensing [6]. In contrast, we lay stress on the government subsidies in R&D race in the presence of licensing, including ex ante and ex post licensing.

2 The Model Assumption

Consider a Bertrand duopoly market where two competing firms (denoted by M , $M = \{1, 2\}$) producing heterogeneous products. The degree of substitution is represented as d ($0 < d < 1$). The marginal costs of firm 1 and firm 2 are c and $c - \varepsilon$ respectively, where ε is the magnitude of the cost-reducing innovation by firm 2. Both constant costs are zero. The inverse demand functions are given by

$$p_1 = a - q_1 - dq_2 \, , \, p_2 = a - q_2 - dq_1 \, , \tag{1}$$

where a represents the capacity of the market, and p_i , q_i denote the price and output of products of firm i , $i \in M$. Regarding the R&D race, assume the winner will be authorized a cost-reducing innovation patent with magnitude ε' . The time required τ_i is subject to a Poisson distribution, that is

$$\Pr(\tau_i \le t) = 1 - e^{-h(x_i)t} \, , \; h(x_i) \equiv \frac{F_i'(t)}{1 - F_i(t)} = 2\lambda\sqrt{x_i} \; . \tag{2}$$

3 Licensing Equilibrium Analysis

Market Equilibrium. In the Bertrand market, the equilibrium outputs and profits are deduced as

$$q_1 = \frac{(a-c)(1-d)(2+d) - d\varepsilon}{(1-d^2)(4-d^2)} \, , q_2 = \frac{(a-c)(1-d)(2+d) + (2-d^2)\varepsilon}{(1-d^2)(4-d^2)} \, ,$$

$$\pi_1 = \frac{[(a-c)(1-d)(2+d) - d\varepsilon]^2}{(1-d^2)(4-d^2)^2} \, , \pi_2 = \frac{[(a-c)(1-d)(2+d) + (2-d^2)\varepsilon]^2}{(1-d^2)(4-d^2)^2} \, . \tag{3}$$

To guarantee $q_1 > 0$, assume $\varepsilon < \dfrac{(a-c)(1-d)(2+d)}{d}$.

Ex ante Licensing Equilibrium. Assuming licensing by means of general fixed-fee plus royalty (f_0, r_0) , $f_0, r_0 \ge 0$, the efficient unit costs of firm 1 and firm 2

are $c_1 = c - \varepsilon + r_0, c_2 = c - \varepsilon$, respectively. Then the equilibrium outputs and profits in this case are

$$q_1' = \frac{(a-(c-\varepsilon+r))(1-d)(2+d)-dr}{(1-d^2)(4-d^2)},$$

$$q_2' = \frac{(a-(c-\varepsilon+r))(1-d)(2+d)+(2-d^2)r}{(1-d^2)(4-d^2)},$$

$$\pi_1' = \frac{[(a-(c-\varepsilon+r))(1-d)(2+d)-dr]^2}{(1-d^2)(4-d^2)^2}, \pi_2' = \frac{[(a-(c-\varepsilon+r))(1-d)(2+d)+(2-d^2)r]^2}{(1-d^2)(4-d^2)^2}. \quad (4)$$

Maximizing firm 2's overall payoff, the optimal royalty can be expressed as

$$r_0 = \min\{\frac{d(a-c+\varepsilon)(1-d)(2+d)^2}{2(4-3d^2)}, \varepsilon\}. \quad (5)$$

The overall payoffs of firm 1 and firm 2 are

$$\pi_{01} = \pi_1,$$

$$\pi_{02} = \pi_2^L(r) = \pi_2' + (\pi_1' - \pi_1) + rq_1'. \quad (6)$$

Ex post Licensing Equilibrium. By the same way, the ex post equilibrium outputs and profits are as follows

$$q_W = \frac{(a-(c-\varepsilon-\varepsilon'+r))(1-d)(2+d)+(2-d^2)r}{(1-d^2)(4-d^2)}, q_L = \frac{(a-(c-\varepsilon-\varepsilon'+r))(1-d)(2+d)-dr}{(1-d^2)(4-d^2)},$$

$$\pi_W = \frac{[(a-(c-\varepsilon-\varepsilon'+r))(1-d)(2+d)+(2-d^2)r]^2}{(1-d^2)(4-d^2)^2}, \pi_L = \frac{[(a-(c-\varepsilon-\varepsilon'+r))(1-d)(2+d)-dr]^2}{(1-d^2)(4-d^2)^2}. \quad (7)$$

The corresponding optimal royalty is

$$r_1 = \min\{\frac{d(a-(c-\varepsilon)+\varepsilon')(1-d)(2+d)^2}{2(4-3d^2)}, \varepsilon'\}. \quad (8)$$

Additionally, assume

$$\varepsilon' < \frac{(a-c+\varepsilon)(1-d)(2+d)}{d}. \quad (9)$$

And the overall payoffs of the winner and the loser are

$$\pi_W^L = \pi_W + (\pi_L - \pi_L^{NL}) + rq_L,$$

$$\pi_L^L = \pi_L^{NL}. \quad (10)$$

4 Optimal Government R&D Subsidies

Based on previous assumption, the overall profit of firm i can be derived as

$$\Pi_i(x_i)=\int_0^{\infty} e^{-rt}\cdot e^{-[h(x_i)+h(x_j)]t}\cdot[\pi_{0i}-(1-s)x_i+\frac{\pi_W}{R}h(x_i)+\frac{\pi_L}{R}h(x_j)]dt, \tag{11}$$

where s represents government subsidy ratio.

From the reaction functions, the optimal x_i and x_j can be deduced, denoted as x_i^* and x_j^*, respectively, the optimal net social welfare can be represented as

$$NSW^*(s)=\Pi_1^*(s)+\Pi_2^*(s)+CS^*(s)-sx_1^*-sx_2^*, \tag{12}$$

where

$$CS^*=\int_0^{\infty}[CS_0+\frac{h(x_1^*)CS_1+h(x_2^*)CS_1}{R}]e^{-(R+h(x_1^*)+h(x_2^*))t}dt\cdot$$

Maximizing the net social welfare, the optimal government R&D subsidies then can be reached.

5 A Numerical Example

Assuming initial conditions $a=400$, $d\in(0,1)$, $c=50$, $\varepsilon=10$, $\varepsilon'=10$, $\lambda=0.7\%$, $R=0.1$. It can be proved the optimal government R&D subsidy is zero by quasi-newton iteration method. That is, form the view of maximizing of social welfare, the optimal subsidy strategies for the supposed R&D race is no subsidy.

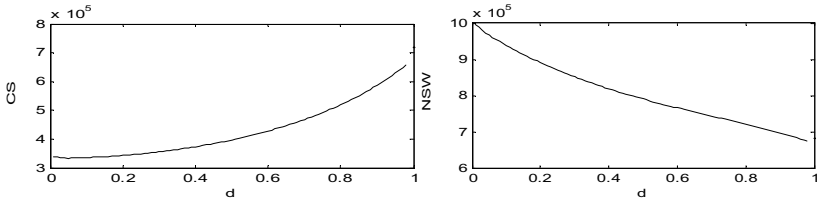

Fig. 1. Impacts of product differentiation on CS and NSW

It can be seen from Fig.1 that the equilibrium consumer surplus is increasing in the degree of differentiation, while the equilibrium net social welfare is decreasing in it.

6 Conclusion

An optimization model for government's management in the process of technology R&D is proposed in this paper, with the considering of both ex ante and ex post licensing. A numerical example is analyzed with quasi-newton iteration method, finding the optimal subsidy is no subsidy in that case, followed with the discussing about the impacts of product differentiation on the equilibrium consumer surplus

and net social welfare. The model is proposed to be a theoretical reference for technology management strategy in reality.

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Employment Service and Instruction for the Disadvantaged Group of University Graduates in the New Period Guided by "Three Hopes"

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Abstract. In order to provide a good employment service and guidance for the disadvantaged groups of university graduates and help them to start their career smoothly, the necessity of the employment services and guidance was studied first. Based on this, some concrete countermeasures of the employment services and guidance guided by "Three Hopes" are put forward: to strengthen the ideological education of the disadvantaged groups of university graduates to provide an ideological guarantee for employment; to improve the practical capacity of the groups to provide a realistic guarantee for employment; to improve the employability of the groups to provide an powerful ability guarantee for employment. "Three Hopes" is a beacon to light the work of the employment guidance and services in the new stage.

Keywords: "Three Hopes", Disadvantaged groups, Employment, Guidance, Service.

On the 100th anniversary celebration of the founding of Tsinghua University, General Secretary Hu Jintao delivered an important speech to the national youth students, in which the "Three Hopes" was proposed. General Secretary Hu jintao hopes that the cultural knowledge learning can be integrated closely with morality education, the creative thinking can be integrated closely with social practice, and the overall development can be integrated closely with personality development (2011). It is obvious that the "Three Hopes" is not only the new presentation and summary of the cultivation aim of the talent training in the new period, but also the orientation of the educational work in the new stage. It is also used as a beacon to light the work of the employment guidance and services.

1 To Realize the First Hope through Strengthening Ideological Education to Provide Thinking Assurance

To realize "the close combination of the cultural knowledge learning and ideological and moral cultivation" proposed by General Secretary Hu Jintao.

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1.1 The Application of Incremental Training Mode

The cultivation of employment competitive power should be conducted throughout the whole process of the four-year college learning. Through the three-step method of classroom education, practice learning and social practice, the disadvantaged groups of graduates can build correct and scientific employment awareness. Firstly, classroom teaching is the starting point. Ideological and political theory teaching should be "people-based" and oriented by employment training. The task-driven method can be adopted in the theory teaching, in which the knowledge can be learnt in an interesting and meaningful teaching situation. Through independent exploration and interactive cooperation, students can learn the connotative knowledge in the problems, cultivate thinking skills and problem-solving ability. Secondly, guided by the employment demand, good campus culture environment of employment can be built, and students are encouraged to make full use of the theoretical knowledge and practice skills. In the process of training, the enterprising spirit, loyal dedication, gradually successful life attitude are cultivated. Finally, ideological and political theory course teachers should help students resolve the confusion in career plan, job application, communication and practice, and encourage students to combine professional theory with social knowledge to strengthen their employment competition.

1.2 To Enhance the Cultivation of Humanism

Affected by many factors, the disadvantaged groups may have many problems. For example, poor faith consciousness, anxiety, and unscientific life planning. The improvement of the humanism spirit benefits the graduates for life. This requires the teacher to focus on science knowledge along with the combination of the scientific knowledge in application, to reconsider both the advantages and disadvantages science has brought to nature, society and human civilization, to guide the advantaged groups to build scientific values, to work hard, to be cooperative and dedicated.

2 To Realize the Second Hope by Improving the Practice Ability to Provide Employment Assurance

Combining the cultural knowledge learning and ideological and moral cultivation is the second hope proposed by General Secretary Hu Jintao. To realize this hope requires enhancing students' practice ability. The efforts are needed as following:

2.1 Comprehensive Ability Should Be Improved in Order to Meet the Needs of Social Development

First of all, it is necessary to cultivate the subject consciousness of employment. Professionally, the groups should deepen their understanding of their own and the society, strengthen the professional consciousness, establish professional ideal,

focus on professional morality, build correct viewpoint on career, cultivate independent consciousness, make definite professional development goals, develop career development strategy and plan, and motivate their autonomy of the career development and employment. Secondly, it is necessary to build a reasonable knowledge, quality and capacity structure, through which they can be achieve the combination of the comprehensive development with the individual development, the combination of the professional quality with the humanistic quality, and the combination of ability with morality. And it can improve the overall quality, and enhance employability and competitiveness of the graduates. Finally, it is necessary to contact the society timely and actively. Based on the deep research of the society, the graduates should make quickly response to the society demands and changes, and then their abilities and qualities can be cultivated on purpose to match the demand of social development.

2.2 Strengthen the Employment-Oriented Functions to Enhance the Employability of the Disadvantaged Groups of Graduates

Based on the practical needs, colleges should deepen the reform of education and teaching. According to the economic and social development and the changes of labor market, based on the practice base, universities should further carry out education teaching reform, adjust disciplines setting, focus on key links, such as the practice teaching, innovative education, innovative talents education and training mode, cultivate practice skills, and make great efforts to improve the employment competitiveness of the disadvantaged groups.

Oriented by students, colleges should enhance the effectiveness of the employment guidance. On the one hand, employment theoretical guidance should be strengthened. The course of "career planning and employment guidance of college students" should be taken as a compulsory subject and be incorpoarated in the teaching plan, and the employment guidance institute should be founded at the same time. The university should provide teachers and funds to support the research and reform of teaching methods, contents and forms, and provide employment guidance to the disadvantaged groups. On the other hand, employment practice guidance should be strengthened. Through positive employment guidance lectures and job trainings, the groups can obtain indirect experience of employment. By conducting a series of employment guidance activities, such as the business start-up competition, career design competition, simulated recruitment competition and other large employment activities, the disadvantaged groups can take part in the activity, and obtain direct experience of employment. Therefore, colleges and universities should strengthen the cultivation of comprehensive ability mainly including practice ability and creation ability, and make the groups obtain stronger competitiveness both in the theoretical area and in the practice operation aspect.

To adhere to the objective of employment, build various service platforms. Colleges should make full use of new media to build information platform and realize employment informatization. More efforts should be made to convey the employment information to the groups timely and accurately, make the employment

information "walking into" the university, extensively use various institutions to build employment advertise platforms to actively advertise the advantage and specialty of the disadvantaged groups of graduates, and encourage the groups graduates "going out of" the university. Cooperating with employment unit colleges should build two-way selection platform to provide enough opportunities for the disadvantaged groups of graduates and build a solid foundation of the employment.

2.3 The Employ Unit Should Strengthen the Cooperation with Universities to Promote the Employment of the Advantaged Groups of Graduates

Employing unit is the terminal of the students' growth. The affirmative recognition of the current college education system and employment mechanism depends on the employing unit by expressing its approval to the universities talent's cultivation. On the one hand, the employing units should establish scientific personnel awareness. The talents competition should be open, equitable, and prefer orientated, which can do favors for the excellent talent coming to the fore. In order to make everyone exhibit his ability and talents adequately, the university should set the post according to demand-based, employing staff according to competition, pay them according to different post, carry out equal payment for equal work, and promote contract management. On the other hand, the employing unit should strengthen the cooperation with universities. Because the graduates are the human rescources of the employing unit, employing unit should participate in the cultivation of university students. Therefore, universities and employing units should establish a combined mechanism to improve employment ability of the students, and shorten their role switching time. This can give the disadvantaged groups fair competition opportunities which reflects the humanistic care.

2.4 The Government Should Perfect the Relevant Mechanism, Improve the Employment Rate of the Advantaged Groups of the Graduates

Perfect the legal system, optimize employment environment. It is imperative to improve the relevant legal system of employment, ensure fair employment, prohibit employment discrimination. The employment discrimination has been in common. It is not the simple autonomy issue of the employing units, but the big problem of social fairness and justice. Therefore, with the respect to the employing units, the government should perfect and strictly enforce the relevant laws and regulations, build equal, fair, reasonable employment atmosphere in the whole society, and realize smooth employment.

Optimize industrial structure, create more employment posts. Economically, the main reason of difficult employment is that the students supply is far more than the demand of society. The increase of the job post is far behind that of college graduates. Therefore, we should try to develop productivity, optimize industrial

structure, accelerate the development of knowledge-based industries, optimize resources configuration, and basically solve the difficult employment problems.

Broaden the channels of employment, advocate employment diversity. On the one hand, the university should guide and support the disadvantaged groups of graduates to work in the private companies or the undeveloped region. On the other hand, the university should continue to promote the development of related employment projects, such as “one college plans," "college students volunteer service western plan", "three assistances and one relief" and "college graduates enlistment take compulsory military service plan".

3 To Realize the Third Hope by Improving the Employment Ability to Provide the Ability Ensurance

"combining the overall development and personality development " is the third hope proposed by General Secretary Hu Jintao. To achieve this hope, students need the comprehensive development as well as the individualized education. Marxism (1972) said that the all-round development of man should include three aspects. The first is the person's free development and application of physical and mental energy. The second is the multidimensional development of person's talent, interests and aesthetic ability. The third is the development of communist lofty moral character, the idealized personality with truth, virtue and beauty inspires. As to each student, overall development means his own individualization. Therefore, according to the request of overall development, individual character development is a changing process from heteronomy to individual self-discipline related to individual wisdom, indomitable courage, good quality, which is also the purpose of the overall development. The university disadvantaged groups of graduates is a special group. Individualized guidance and service is needed to improve the employment ability in order to achieve smooth employment.

3.1 The Professional Education for Girl Graduates

Of all the disadvantaged groups, the girl graduates may have more difficulty in job hunting. Therefore, it is imperative to strengthen education reform and improve the integrated qualities of the female college students. The education contents should be close to the needs of society, education should consider the sexual distinction, and special professional education can carry out just for girl students. For example, the university can arrange rich female courses to guide them to obtain professional qualification certificates to equip them for more choices in the market, and teach them how to succeed in employment.

3.2 To Strengthen Individualized Employment Guidance and Psychological Service

The individualized employment guidance and the psychological counseling means giving pertinently guidance and counseling according to specific situation, major

and social needs. Through employment guidance and the psychological counseling, the graduates can evaluate themselves correctly, cultivate practical employment awareness and keep healthy psychology. Besides, they can face the difficulties in their life, solve the social injustice with a correct attitude, and have a correct view on interests. The university students should evaluate themselves correctly, set up correct employment awareness, keep healthy psychology, equip themselves the ability to solve difficulty both in work and life, correctly treat social injustice and interests, actively present their talents, constantly improve the employability, and perfect their life.

3.3 To Provide Necessary Convenience for the Graduates

This is of great significance for the disadvantaged groups. The HR department, education department and employing units can get together to set up practice base, which is a bridge for communication between university and enterprises. Practice base is an experimental plot for the groups, where they can make a good combination of professional theory with the practice, enhance their working ability, accumulate working experience, and lay a good foundation for the future employment. Practice bases also benefit employing units, which can set up a good platform for the employer to backup the talents. The groups participation in practice can be subsidized by the government, which can not only resolve actual difficulty of the groups but also decrease the cost of training new staff. The enterprise may spend the whole probation period to put the students through its paces. Based on the better understanding, the enterprise can assign the graduates to the appropriate posts, which can reduce the risk caused by the wrong choice and reduce the cost. Many other efforts can also be made to help the disadvantages.

All in all, strengthening ideological education, improving practice ability and employment ability can realize the "Three Hopes" proposed by General Secretary Hu jintao, and be conscientious and make a good job of the employment guidance and services of the disadvantaged groups of graduates, so as to achieve social harmony, stable and healthy development.

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A Research on CDIO Engineering Training Innovative Practice Teaching Program in Ethnic Areas

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Abstract. Cultivating engineering and technical talents is currently the most pressing issues faced by higher education. The core of CDIO engineering education is trains engineering and technical ability, the primary task is combines developing CDIO education reform with current education instruments and textbook. In terms of topics on teaching content about innovative practice, the implementation of concrete plans and practical results, CDIO engineering training innovative practice teaching in universities of ethnic areas is not only in the direction of engineering professional education development, but also the necessary condition that enhance the overall quality of engineering and technical talents of ethnic areas. Having been achieved a success on carrying out CDIO classical engineering practice teaching in the universities of ethnic areas, and also improve the students' ability of practice, teamwork, expression and independent study and other ability.

Keywords: Ethnic Areas, CDIO, Innovative Practice.

1 Preface

The universities of ethnic areas, especially in northwest area college graduates feel quite stressed about the new situation of employment. It is a problem which how to enhance employment competitive power of college graduate students in this area should be solved urgently. CDIO engineering educational mode is an emerging achievement in recent international engineering educational reforms. The research group of multinational is composed of four universities such as MIT and KTH, which received large sponsorship nearly $20 million, form Knut and Alice Wallenberg. They established CDIO engineering education philosophy over four years of research and exploration, and set up an international cooperation organization was named CDIO. CDIO represent Conceive, Design, Implement and Operate. It from product development to life circle of the product running was used as carrier, to make students study the engineering with the way of organic link between the initiative, practice and courses [1]. Our school uses the achievements of foreign educational fruits and applies to engineering training innovative practice educational project of Electronic and Information Engineering students. We

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analyzed the various data which from the participation in this education reform and found that the students were more advantageous in participate the innovative practice training reform on mastering to engineering technology capacity, and they had become noticeably stronger.

2 The Topics on Teaching Content about Innovative Practice

The core of CDIO engineering education is trains engineering and technical ability. The first problem of developing CDIO education reform should be solved is that the combination of engineering technique and current education instruments and textbook. It is also a key to choose a good teaching content about innovative practice. Most universities of ethnic areas Electronic and Information Engineering students are come from minority area rural. For advanced coastal regions in the field of information technology, they have only a limited knowledge of this project; do not talk to understand more. So the initial CDIO engineering education topical can only be put into the aspect of rural electronics technology application. Through rural electronics technology explanations, we guide students into the knowledge of specialized courses. After students make an initial understanding on some common electronics technology, they will be trained a step by step to factory engineering project demands.

While we develop CDIO teaching, we also established a university students' scientific technological innovation Engineering Training Center by assigned personnel, and the Engineering Training Center take in charge of specific job. According to the universities of ethnic areas students' feature provided the topic approach, to ensure the topic can meet the students in Ethnic Minority Regions demand, confirm ideology targets and fully argue about creative project. The innovation is mainly aimed at Ethnic Minority Regions innovative project, chose appropriate forefront topic only to a part of excellent students. School opens up the matched science and technology activities for this part of students to actively promote the engineering education.

Students explore the seat of social matters such as life, custom, ecology and economy first. They conceived some new issues by themselves. Then hand in the document which written into this issues to tutor. While tutor received the research or conceived documents from students, further discusses the practical feasibility of the projects with students. After they agree on basic plan, then through hold the college students technological innovation engineering training center assessment, to verify adequately and perfect plan for the implement of project by project assessment. Especially review the students projects conceive, design process, implementation methodology and operation mode. The topics on teaching content about innovative practice tried to be more perfect by this process.

For example, the students who major electronic information engineering in second classroom of our school practice activities, think for themselves and be coached further especially in their design process to make a two round discussion and evaluation. Being used specific practice venue such as second classroom as particular main location. The students of developing project together to study, guidance and practice. Completing following projects on the college student

technological innovation engineering training center: the hatching silkworm egg system design based on experts fuzzy control technology, environment monitoring system based on ADUC842, street light control system based on wireless sensor network, the research of a power-saving electronic switch, bus stop automatic system based on wireless sensor network and the research of smart home systems based on ARM.

3 The Implementation of the Innovative Practice Teaching Content

At first, we take the electronic information engineering students mocks that the content mainly around the students. We adopt an open book exams to investigate emphatically students problem identifying and solving skills. Looking for some clear thinking, relatively clear students to make them to the interview stage. It is students impromptu capability that be investigated during the interview. After the two-round examine, not only we can master the students' basic ability, but also can definitely thinking of training students in step.

In the entire CDIO engineering project implementation process, students begin their work to follow the tutors' conduct. The students work is also body of CDIO engineering project implementation. We divide students into groups first, every 3 students work in a small group. If the conditions are permitted, arrange for 1 girl and 2 boys to constitute a group as possible. Then students come up with the preliminary plan, depend on the situation of team.

By 12 standards of CDIO training, tutors make an interactive discussion with students in the demand of project preliminary plan innovation, including the project application prospect and group building [2]. After forming teams are done, excavate the scheduled task to every student in their teams and analyze what suitable for everyone should be done. Students put their heads together to discuss while they finish discussion and analysis. Students' subjective initiative should be given a full play. During the process of project implementation, played a part not only in tutors instruct, but also in subjective role of the students, and increase the interactive communication abilities between teachers and students, so as to be reached the teamwork demand of the CDIO outline.

Taking practice activities of the students who major electronic information engineering in our school as example, students trained CDIO engineering education innovative method, they don't absent class or wander off course as before. On the contrary, they can transfer theoretical study into making progress together theory with practice and the direction of penetrative studying. Students improve nor only their practical capabilities but also their teamwork communication and language skills.

4 The Concrete Practice Project Practice Effect

It is with one of the innovative experiments "The Hatching Silkworm Egg System Design based on Experts Fuzzy Control Technology" that we directed example,

the project have adopted Experts Fuzzy Control Technology to design and produce a package deal silkworm incubation control system, and we can require temperature, moisture air, light and other environment conditions by the different physical phases. Self-service wireless intellectual sensor network collect the environmental factors of different notes. Depending on experiments of experts, deal with the collected environment factors and intelligent control silkworm rooms' environment factors to differently growing stage. Designing and conducting a suit of low-cost multi-point wireless silkworm room with the environmental factors monitoring system.

Artificial incubation is an important point of the silkworm breeding technology, it also the production phase which has high technical requirement. Artificial incubation situation will influence the silkworms hatch the orderly and strong body directly. It also directly affects the economic benefits of sericulture. Hence, the research of silkworm incubation test system has always been a leader on the development and application of sericulture production tool. It has become a focus to the sericulture technology competition both in home and abroad. Sericulture is the pillar industry of Yizhou in Guangxi, it concerned the people livelihood. Controlling temperature and moisture of the silkworms has an important significance.

In order to improve the feeding quality and economic benefits of normal silkworm raiser, our project will based on the experts' knowledge, the silkworm age as main line and combination all sorts of environment factor couplings to design a silkworm room with environmental factors multi-point wireless sensor and monitoring system. The experts experiences will make the normal silkworm raiser achieve the process of breeding expert environment factor which be controlled reasonably by the intelligence measuring and controlling the procedure.

The project has solving silkworm growing disadvantages of environment monitor worker intervening more often bring outside germs in silkworm room. The experts guiding the processes of their experiences are achieved by the programming to lower the barriers and the technical input the cost of the silkworm raiser. Multi-point wireless silkworm room with the environmental factors monitoring system is easy to operate, easy to use and low cost that can be easily used to spreading and applying in rural.

We have made a series of achievements in the implementation of this project. Published 1 paper(retrieved ISTP) on International Academic Conferences, Chinese core journal 2, declared utility models a patent, declared a national software copyright registration and attended the "challenge cup" Guangxi university student's extracurricular academic work to acquire the third prize in the contest. "I participate the study of CDIO training, not only my comprehensive quality be enhanced greatly, but also possess certain ability to compete job with coastal cities colleges as a university of ethnic areas student. I will never feel inferiority about the University Students' of Minority Inhabited Regions" they wrote when they summered the personal.

5 Conclusions

The paper studies the CDIO engineering training innovative practice teaching in the universities of ethnic areas. Having been achieved a success on carrying out CDIO classical engineering practice teaching in the universities of ethnic areas, and also improve the students' ability of practice, teamwork, expression and independent study and other ability. We put CDIO engineering training innovative practice teaching into the universities of ethnic areas electronic information engineering professional practice teaching, promoted the transform of electronic information engineering professional and derived the pace of engineering students who learn in universities of ethnic areas.

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The Electronics Experiment Teaching Reform Base on the CDIO

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Abstract. The introduction of the engineering student CDIO teaching mode, designing content system with novel electronics experiment course, reconfiguring the laboratory of resources, improving the condition of laboratory, increasing the teaching content which students interested to arouse them learn more knowledge and taking the effective evaluation to the process of learning. So as to achieve the goal which teaching reform of cultivating outstanding engineers. CDIO teaching mode make students clearly understand the electronic. It also strengthens reasoning electronic experiment project and promotes the ability to solve problems in terms of the students' professional ability and attitude. It is the technical foundation knowledge and the new electronic invention that is achieves cultivating excellent electronic engineers. Cultivating the student's thinking at the respect of Project system by implementing the experiments of production engineering and contrasting the discoverable knowledge.

Keywords: CDIO, electronics experiment, engineers.

1 Introduction

The research of theoretical knowledge was focused on training in the traditional education. While the electronics experiment course mainly includes the verification experiment and then get a result which consistent with the theoretical knowledge. It is the students' theoretical knowledge studies are the key develop that might cause the purpose of realizing the corresponding talents is getting harder. What investigation of current electronics college graduates is that the ability to conceive, design, implement, operate to the complex and high value-added electronic products processes and system engineering under the circumstance of existing team [1]. CDIO engineering teaching reform, especially electronics foundation course that's an introduction to the CDIO engineering teaching mode, enable students to deeper grasp the electronic technical foundation knowledge, learn to master the new electronic products, processes, the construction and operation of system. Recognizing the importance and strategic impact of society that researching the development of electronic technology and thereby achieve the goal of cultivating excellent electronic engineer.

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2 Optimizing Content System of Electronics Experiment Course

We redone and updated the teaching outline, especially practical application class hours to face the teaching reform of universities in the new period. Optimizing and enhancing the content of electronics experiment course for make college students with excellent engineers' professional skill quickly. According to the existing CDIO syllabus which strengthen reasoning electronics experiment project and promote the ability to solve problems in terms of the students' professional ability and attitude. Cultivating the student's thinking at the respect of Project system by implementing the experiments of production engineering and contrasting the discoverable knowledge.

We plan to simplify the contents of proof experiment. What we integrate is that the proof experiment content which contained similar, relevant and even repeated in the different experiments is getting students to make use of their spare time to get ready for experiment. For instance, optimizing and integrating the one-order, two-order and states response experiments in the course of Circuit Analysis and Signals and System. Uniting the power amplifier circuit and oscillate circuit in the teaching of Analog Electronic Circuit and High-Frequency Electronic Circuit.

The teaching contents introduced to engineering project. Disintegrating each teaching experiment project, putting forward the requiring skills and percipient information to the content of each step disintegrated. It can enable students to understand the aim of the experiments quickly and prepare the new experiment well when they preview the experiments. Students can design, implement and operate to the entire electronic product development during they learn the basics. It impelled the complex and boring experiment courses to adjoin to the industrial production at present.

Increase writing project papers. We have to assess electronics experiment courses' results while completed the two stages. We had established the electronics experimental teaching reform when finish the task of evaluation of students. Writing theses which contained the subentries of engineering objects is one of methods that inspected students. Students will review the fundamental experiments when they writing the theses, then analyze and summarize the finished projects.

3 Increasing the Diversity of Learning Contents

The experiment of electronics engineering students, a majority of proof experiments completed with the experimental box. Students can finish the experiment passively on the basis of experimental instructions without the understanding of circuit. It reflects on the vapidity of experiment courses and tuition hard. In order to chart the path for engineering students, we optimize the content system of electronics experiment courses. After several years of exploration, we have integrated experiment content and abstracted a set number of typical circuits or systems which include lots of knowledge. Let the students combine freely, for 2-3 people each group which demanded to fabricate and debug circuits until it work normally.

What's more, the division of labor is encouraged to finish the tasks. Be in already on some foundations, the relevant proof experiments are completed by the groups. Finally, the groups need to increase the functional circuits and realize the functions on the basis of proof experiments. For instance, we offer amplify circuit composed by divided components to students when organize them practice welding technology and knowing components. According to the process of electronic products development, students debug on the breadboard to ensure the circuit work regularly. Through the process, the students learn to debug the process of circuits and the way to make it work well. Once we guaranteed the circuit work normally, then students put the components into printed circuit board in accordance with circuit diagrams. Using a wire to connect or jump on the PCB and soldering tin welding to fasten the components. Finally, according to input and output signal, students debug the function of power machine. It can further cultivate the students' ability on which design the circuits and research the application of diagrams. Similar method is used to basic amplifying circuits, negative feedback amplifier, power amplifier, DC regulated power. Students are required to write normative prefab reports and experimental reports all of the experimental contents to cultivate the writing expression and summary ability of students.

We can afford wireless receiver to students as the basic circuit. Students demanded to complete the circuit and debug it on the basis of the diagram.

Students should be able to easily finish the connection and debugging on the breadboard due to the simulation circuit experiment foundation. Using the software of circuit design Students accomplish the fabrication of diagram, the simulation of circuit parameters performance and the connection of PCB. The future work is to print circuit board and transfer the circuit from breadboard to PCB. Students could fulfill the proof experiment such as debugging, enlarge and transmit signal on the circuit.

Students of electronic engineering cultivated the experimental teaching with an incremental approach by team novel teaching mode. Enhance the students' interest of study content via sampling investigation, oral test and the final assessment which base on the diversities of study and experience of CDIO to help students keep abreast of project exploitation procedure so that to stimulate students' interest in learning experiments. Students through the way such as library or network to search the material, it is achieves fruitful achievement that they find the information of circuit or project to practice consciously.

4 The Emphasis on Evaluation Learning Process

The expectation of engineering project is intended to answer the questions such as "What students should grasp and how do they do with the learning of engineering object courses?" The answer is "To reach the expected effect and get the appropriate activities for students" which extracted from the activities of teaching and learning. We will understand the desired results of learning engineering project while evaluate the experimental studies. As show in figure 1, the clear relationship among the expectation of engineering project, the activities of teaching and learning, the evaluation of project is a constructive adjustment [2].

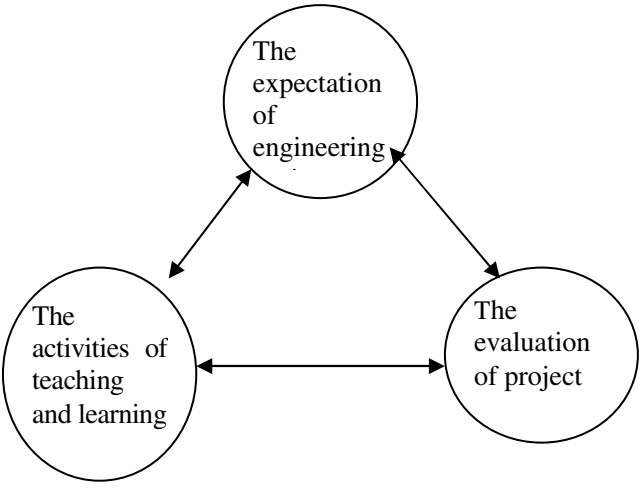

Fig. 1. project of study effect, teaching and learning, evaluation of adjustment

What we evaluate is the experimental teaching of engineering objects which contained three stages, before the start, work in process and the work done.

We will enhance the communication with the theory teachers and the head teachers and understand the students' learning situation. Organizing student to participate in the discussion, understand students' ideas for the first phase of assessment. Guide students to use their spare time to study the usage of breadboard, PCB and the software of circuit design. Students are provided the necessary learning materials, network resource and the studying video for the experiments teaching smoothly well prepared. In addition, Students' prefab reports will be evaluated before the experiments so that they may master the preparation before they carry out the experiments.

In the process of experiment teaching, requests the student to hand the experiment records, review and evaluation with the form of diary or weekly. With none regular spot and questioning of students, according to the students' experiments on the situation of experiment and the circumstance such as experiment report evaluation, in the purpose of understanding the situation and the problems of experiment. Teachers will get it feedback to the students and discuss the solutions with them to reach the goal of experiment teaching.

After finishing the experiment report, accepting the experimental work such as projects and systems, giving the experimental data according to the achievement of ordinary time that composed of prefab reports, lab reports, assessment achievement, and acceptance opuses. Not only correspond to CDIO engineering——The improvement of educational mode by using the result of evaluation and the purpose of learning experiment, but also can meeting the needs of college engineering experiment. It is assessment that allowed everywhere and everyday around us, embed entirely into the process of experiment so that we can collect comprehensively the achievement of improvement of real evidence. We will use

psychometrics to gather information and discuss existent problem with students, make evaluation applying into meliorating education and promoting the development of engineering experiment.

5 Reconfiguring Resources and Improving the Experimental Conditions

The laboratory technician is a big player in teaching of CDIO engineering project. They can serve as a guide and plays an essential role in the experiment [3]. CDIO engineering teaching reform, the first problem of CDIO engineering project to be solved in the contrast with traditional experiment lecture, there are four points that instructor should conquer.

- Experimental advisors might be lack the technical of active learning and lessons-learning about their professional knowledge.
- Experimental advisors and students are unwilling to change the existing methods of teaching and learning.
- Experimental advisors don't like to change any previous teaching contents when these catch conflict with follow-up course.
- Experimental advisors not very good at discover the clash about learning subject matter and the ability to communication skill, as well as the building ability still pose several problems.

We reconfigure experimental resources to help solve these problems. In terms of faculties, ask teachers to develop the individual development plan, invite the enterprise expert to offer the training course or seconded advisors to electronic company to research, product and study. In the process of research and instruction, we establish a partnership with peer companies to improve the professional knowledge and practical experience by carrying out study practice and join in it. We also can hire engineers who are already experienced join in the CDIO engineering teaching to strengthen the ranks of teachers and meet the CDIO engineering teaching reform requirements.

In terms of laboratories and equipments, it is a traditional teaching experiment that only needs the test instrument like a classroom with test cabinet, multi-meter, signal generator, oscilloscope to accomplish the tasks which mainly focus on the verifying experiments. Nonetheless, the laboratories and experiments are far from the desiring of CDIO engineering teaching reform. So we need to optimize and reconfigure the resources scientifically. First, school should provide venues such as computer room to design the circuits and do some jobs about circuit like welding, fabrication, debugging and testing. Allocate the resources reasonably, and then achieve the goal of sharing multiple laboratories by reconstructing slightly. The next thing to be done is to develop a complete set of test cabinet according to current condition to change the traditional fixed structures. Students do the experiment with the combination of adopting breadboard and resolution elements according to the demand of experimental contents and the circuit that provides by teachers. There are many electronic experiments debugged and tested on the

experiments. The task will be fulfilled by configuring test cabinet such as multi-meter, signal generator, oscilloscope, providing resource guarantee for CDIO engineering experiment reform to electronic foundation experiment course.

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The Employment Services and Guidance of the Disadvantaged Groups of Electronics Professional College Graduates

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Abstract. There has analyzed the causes and situations of employment to the disadvantaged groups of electronics professional college graduates. Proposed the employment guidance of electronics professional college graduates should be based on a variety of actual service conditions, and must take some necessary measures, such as employment services and guidance, to solve the employment problems. Makes the disadvantaged groups of electronics professional college graduates to find an appropriate own post, and eases the employment pressure on college graduates. It not only improves students synthesize quality, but also changes the employment concept, so that the students can be familiar with the country employment policy and understand the social occupational information. Also have a clear define about life value and social value,

Keywords: Electronics professional, Graduates, Employment guidance.

1 Introduction

April 2009, The State Council in the "Electronic information Industry Adjustment and Promotion Plan" pointed out that the electronic information industry is a strategic, fundamental and guiding pillar industry in the national economy. It plays a very important role in promoting social employment, stimulating economic growth, adjusting the industrial structure, changing the mode of development and safeguarding national security. November 2009, the Ministry of Education in the "Notice on efforts to the Employment of National Ordinary College Graduates " (Education [2009] 15) pointed out that the 2010 national college graduates is expected to reach more than 630 million people, plus unrealized employment on the previous graduates, a large number of graduates in need of employment. In the cases of the international financial crisis has not been eliminated, and the obvious contradiction between the whole social employment. The employment situation of college graduates in 2010 remains severe, the task is very heavy. The number of university graduates increased year by year, Electronics professional graduates also increased significantly. Domestic almost 2/3 of undergraduate colleges and universities have set up electronics professional [1].

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2 The Situation of the Disadvantaged Groups of Electronics Professional College Graduates

"Job competition is intense and works difficultly to get" becomes the largest employment pressure on the current electronics college students, College students employment is also become the social problems which caused by the whole society common concern. Not yet graduated, college students have been carrying a heavy psychological burden, they can do nothing when in the real face of social provide to employment opportunities for them, they don't dare actively participate in human competition in the job market, display and promotion themselves to the employer. On the other hand, the fresh graduates are expected highly to their employment. Even if do not reach the capacity of their own, they often like to ask to get the same wage treatment as other students in their class, who once effort to get, and then choosing employment out of fact.

Under the influence of market economy, the values of employment of college graduates is tend to utilitarian, idealistic and interested. Graduates often take the location of a unit, bonuses, housing and other material requirements into consideration when they are choosing their careers. More consider only to the best individual interests of the current, concerned only with their wealth of material life, Lack of hard-working and work hard spirit, even don't have any ideological consciousness to contribute to state and social. Affect by the elite education in China, most college graduates located their employment in the state organs, scientific research areas, institutions and state-owned enterprises. Treat enter the country Enterprises as the "iron rice bowl", however, this idealized values is very difficult to achieve in the beginning of searching for job. In addition, contemporary university graduates easy emphasize on personal interest while choosing their jobs.

Under the severe employment situation, College student employment has become a social common problem. On the one hand, the oversupply of the labor market, on the other hand, it is desperate for businesses. Practical ability of many graduates can not meet the requirements of businesses. Because of the students' own factors and the school education, students can not be combined organically by theoretical knowledge and practice. Especially, the content of scientific experiments of electronics students is unreasonable designed. They are less able to practice experiments, and lack of systematic engineering practice and thinking keen to respond to emergencies, etc. Some students are due to poor professional practice ability so that missed their appropriate positions. The lack of professional practical ability of electronics students is serious impediment them to display and exert their professional skills.

When the information construction of labor market in our country is still at a low level, due to the geographical location of the school and the family and other reasons, it is very limit to obtain employment information for the new local university students. They often need to take a longer time to search for employment information in the labor market. New local university students, mostly from rural areas, due to family financial difficulties, they have little economic power to collect employment information everywhere. Students in rural households have fewer social relations and network resources, make them have less employment information resources than others, and employment are more often passive[2].

3 Employment Services and Guidance for the Disadvantaged Groups of Electronics Professional Graduates

The college graduates of needy families, firstly, they can apply for the job grants from their school. Actually, the university through many ways such as the awards, loans, diligence, subsidy and free, to protect the basic living of the students who from poor families, so they can complete their studies successfully. Now, many universities have introduced policies to offer job subsidies to the needy family graduates who with employment aspirations, give encouragement for the needy family graduates who employment in time. Secondly, the needy family graduates whether before or after graduation, when organs at all levels taking the civil service by examination, institutions recruitment of staff, they can enjoy free registration fees and physical examination of the policy treatment[3]. Graduates of needy families only need to make an application and provide corresponding proofs.

The value of career choice of students is mainly reflected in two orientations. Among them, the pay and benefits, relationships, job stability, job opportunities and other factors are social orientation. Upgrading of skills, work experience, realization of self-worth, professional, interest and other factors are personal orientation. In the process of choosing jobs, electronics students are more tend to focus on improving personal capacity and achieving personal values. Now, students in the process of choosing a career are more emphasis on employers to meet their requirements, rather than consider their own to get the possibility of this career, that the self-centered and perfectionism and other non-rational thinking is still serious among the electronics college students[4] Real difficulty in the employment of college students for many years had significantly corrected such idealistic tendency exist in the career decision-making of electronics college students.

The quality of college students and professional knowledge still stand in an initial stage in the actual need of employers. In other words, one of college students' low employment factors is the serious shortage of capacity. In the times of urging ability, various enterprises are rarely so simple to decide whether they should hire candidates by their academic diplomas and college degrees. Furthermore, the enterprises and employers are focus on the university students' ability to meet the professional requirement, the effect on their post and the development of their potential which they possessed. Digital, analog circuit and C language are the basic individual qualities that should be known well as an electronics researcher. There is a clearly biased demand that contained the mastery of Signal and System, Principle of Communication in communicated corporations. Controlled corporations preferred the employees who have knowledge about Automatic Control Principle, Microcomputer Principles and Interface Technology [5]. In addition, mastering Protel99se technology is the most companies' critical requirements.

Absolutely, the main factor of causing college difficult students endured extreme mental pressures is that the challenging situations. It is subjective factor or objective factor that enables students are lack of employment competitiveness. Consciously or unconsciously, there is a frustration among in their soul that causes them product inferiority, anxiety, interpersonal sensitivity and other psychological obstacle and psychological problem. This all lead up them to a weak position in

the work force. Newly-run region universities are busy constructing the infrastructure and specialty construction, while often neglecting the employment guidance and psychological guidance of difficult groups. It will increase the numbers of vulnerable groups. Therefore, universities should perfect the psychological counseling with the following two areas.

- Establish a professional team which consists of full-time staffs as soon as possible. Counseling is a highly professional work which needs a good expertise to do the job. Only the team which is consists of trained professional that could avoid the deviation from mistaking of guidance. Thus, it is of importance to establish a qualified team.
- Psychological education not only applies in course, but also develops multi-channel. Usually, the students in the university stage only exist in some general questions. In order to prevent the occurrence of an extreme example we should take the precautions to ordinary problems. School may utilize the availability carrier such as school newspaper, radio station and campus network to expand psychological knowledge and create the environment with learning, comprehension and know well psychological on the basis of students' psychological health and teach the related courses accordingly. Getting students to learn the self-psychological adjustment eradicate the psychological puzzlement and improve the ability of tolerance and beating frustration.

The information of electronic engineering students' employment is block. I suggest broadening the channels of getting the information primarily and students should try their best to get the recruitment information. Depending on campus publicity and school network to get the enterprises' recruitment information are limited. In reality, lots of recruitment sites provide a good deal of information about recruitment information like the Zhaopin.com, Chinese network and other professional recruitment websites which provide a great convenience. The professional recruitment websites should be the first priority channel for electronic engineering students to pursuit work.

4 Epilogues

All in all, developing the guidance of employment and service to vulnerable group graduates not only benefit to improve their synthesize quality, change employment concept, help students be familiar with employment policy of the country, understand the society occupational information, make realizing the life value and society value more sense, but also have a profound effect on fulfilling the talent resource allocate reasonably and the human resources development use efficiently.

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Research and Practice of the Teaching Reform for Professional Course

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Abstract. Professional courses are significant for the undergraduate students. Nowadays the teachers face many problems in teaching reform of professional course. One of them is how to improve the quality of professional course teaching and develop students' specialty ability under the circumstance of class hour decreased. On the basis of analyzing the course contents and teaching features for the professional course of "forming methods of sheet metal for airplane parts", the article focuses on the professional course system, teaching method, and teaching fulfillment combining the course teaching process. Firstly consolidating resources in existence, courses system is constructed according to classroom teaching and experiment teaching. Secondly as one of the most important tools in the modern education revolution, that is multimedia teaching method, is applied to classroom teaching in order to increase the student's direct feeling. Finally the experimental teaching including demonstration teaching is carried out. Preliminary achievements are acquired in teaching practice. The students raise the interest in the professional lesson, expand knowledge range, and improve professional character.

Keywords: Course system, Teaching method, Reform in education.

1 Introduction

Professional courses are important for the university students in the teaching system regardless of three layers including the foundation lesson, professional foundation lesson and professional lesson or general education aim. At present, Chinese higher education is exceeding the new step that promotes into the quality. These changes propose higher requests to the teacher's teaching, which involved in information technique fast development, knowledge propagation and update velocity speed, new of education teaching theory continuously appearance and higher education popularized, etc. Now professional lesson teaching hour is greatly reduced. So it is hard question for each professional teacher how to raise the university student's professional character through course construction, reform content of course and teaching method. This paper discussed the reform and fulfillment of the course teaching system, and teaching method bonding the professional course "forming methods of sheet metal for airplane parts".

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2 Course Contents and Characteristics

The course of “forming methods of sheet metal for airplane parts” takes metal plasticity forming theory as theoretical basis, takes airplane metal sheet metal parts manufacturing as object, and develops analytical and problem-solving capability of student for purpose. It emphasizes on the sheet metal forming technique based on the theory close to practice.

The content of course mainly includes various technologies of the airplane sheet metal forming, such as punching, bending, deep drawing, spinning, rubber forming, stretch forming, peen forming, high energy forming, creep forming, stress relaxation and superplastic forming, etc. Each of forming principle, method and its impact factors is introduced in this course.

From teaching contents, it is clear that the contents of this course are miscellaneous and each technology is whole. The course still has strong engineering fulfillment characteristics at the same time.

It puts forward higher request how to get better teaching for the teachers engaged in this aspect professional educations along with the manufacturing technology, the various new theory, new technique, new method continuously flowing out now. In order to keep up with the step in age, satisfy the requirement of developing created compound talented person, it is necessary to carry on reform in professional education.

3 The Course System Construction

Course system and contents of course are very important for the talented students develop quality. The course system has the important action of layout overall situation during the whole teaching. It must deal with the relation of width and specialty.

The content of course of university and college's getting behind with age is current question. However, content of course's falling behind is absolute because they are existing science technical reflections. The students completely probably master these foundations, thus acclimatize themselves to the age progress based on science techniques which exist or will appear. So it is significant that what is foundation. The foundation is confirmed according to science and technology development trend.

Along with implementation of profession construction, laboratory construction and related topic item, a lot of course resources can be used for teaching process on the basis of summary. Thus we not only can well make use of the resources, but also strengthen the comprehension of the student to the professional knowledge and raise the student's professional character.

After this course studies to end, the students still need to carry on a production practice and molding tool professional course design. Because the students don’t learn equipment course about crank press, they have difficulties in the follow-up molding tool professional course design.

Combining this course's location in the whole teaching link and existing condition, according to the course characteristics, the course system is made out (shown in Fig.1). The system make up of the classroom teaching and experiment teaching, raising the contents of press machine at the same time.

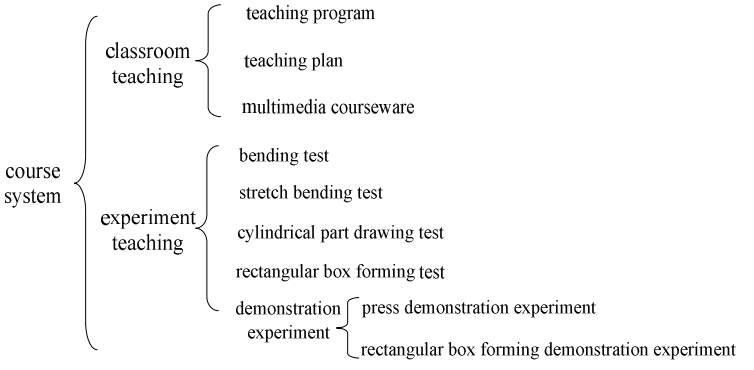

Fig. 1. Course system

4 Teaching Method

The reform of the teaching method is also an important aspect to improve the quality of professional course teaching and develop students' specialty ability. Its main direction lies in raising study interest in the course, opening the student's intelligence and developing an accurate thinking method, so that the students can put forth problems, analyze problems and solve problems by themselves. It is necessary to carry through "teach according to his ability" principle in addition.

It has already been several years to advocate the heuristic method of teaching by Ministry of Education and each university, but the students are quite dissatisfied with the cramming method of teaching. This needs the teacher seriously treat teaching.

The teaching activity is a process that information delivers by certain medium, however the same information can be spread by the different medium, and the same medium can spread different information again. Therefore, teacher should reasonably select medium according to the contents of information, the character of instructional media and the function of teaching. In order to obtain the best teaching effect, the synthesis of various medium is necessary.

Teaching method and teaching process of the course should be changed while the request to the teaching continuously updates. The past was a traditional teaching method, namely the single teacher writing on the blackboard teaching. Because the course involves a lot of forming craft and the equipment, also the fulfillment is strong, so the students widely feel that the course is dull and keep a view worse while studying. In these circumstances, on the basis of meticulous organization and preparation the multimedia courseware, the multimedia teaching

method is applied to classroom teaching in order to increase the student's direct feeling. After adopting multi-media teaching software, the students mostly feel the course easily understand and have a deep impression with the contents.

Follow principles are adopted in the teaching:

(1)Standing on the students' angle to consider an arrangement tuition contents and designing classroom teaching.

(2) The leading role is a teacher in the teaching, the master of teaching is a student.

(3) Noting to train a student capability of finding problem, analyzing problem and resolving problem.

In fulfillment of teaching, we profoundly realize that it is necessary that teacher choices and develops fine multi-media teaching software according to the requirement of tuition contents in the classroom teaching. With meticulous organization, comprehensive usage, making the whole function of teaching system receive full exertion, contacting the teacher's predominance with the student's master, this will not only raises the teaching effect of classroom, but also greatly stimulates the student's creative thinking and fosters the student's creative capability.

5 Practice Link

The experiment reform that trains students to synthesize character and working ability also necessarily go with the thorough progress of the reform in education. How to make use of the resources, raise teaching fulfillment link, improve the operation capability is the problem that professional teacher needs think over.

On the basis of existing experiments, such as bending test, stretch bending test and cylindrical part drawing test, rectangular box forming experiment of segmented variable blank holder force is setup, which was supported by speciality construction. This experiment content achieves from Doctor's graduate student and Master graduate student previous progress. This not only improves experiment condition but also strengthens practice teaching. Furthermore, the students understand originally professional research direction, make them deepen professional understand, have a passion for own profession. In addition the students also know that the only way which can be competent future work is assiduous study.

The demonstration experiment has great significance for improving students' specialty ability. The press demonstration experiment makes the students comprehend the press structure and working principle. The rectangular box forming demonstration experiment makes the students understand the application of the finite element method (FEM) in sheet metal forming. These broaden students' outlook and lay the speciality foundation for subsequent curriculum study.

6 Conclusions

Considering the practical teaching situation, the teaching reform for professional course involved the whole course system construction, teaching method

betterment, experiment the teaching enhancement and comprehensive evaluation method concerned about the students' feelings. Through the implementation of the teaching reform for "forming methods of sheet metal for airplane parts", the students raise the interest in the professional lesson, expand knowledge range, improve professional character. The practice of the teaching reform for professional course shows teaching effect is good.

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Practice Teaching of Disaster Prevention and Reduction for Engineering Major from 3·11 Earthquake

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Abstract. Severely destructive earthquakes happened in succession in Wen Chuan. Haiti and Japan since 2008, and the situation of global earthquake resistance and disaster mitigation is grim. The importance is highlighted once again by the 3·11 earthquake in Japan to strengthen the disaster-reduction education and improve the whole social consciousness on disaster prevention and mitigation, to which the postgraduate practice teaching education is tightly linked. This article discusses the measures and conceives to reinforce and complete the relevant majors' practice teaching from case teaching, disaster drills, establishing popular science and exercise base and volunteer team construction. It is inevitable requirement for protecting people's lives and property and has important significance for the construction of the national peninsula and the science and technology industry parks to strengthen the practice education on disaster prevention and mitigation major and increase the whole social consciousness on it.

Keywords: 3·11 earthquake, disaster prevention and mitigation, practice teaching, postgraduate.

1 Introduction

The 3·11 earthquake hit Japan and brought different levels of influence to the various countries. The earthquake relief continues and China also gives a helping hand. The order and calm the Japanese performed facing natural disaster is more impressive than the strong undeniable high-rise buildings which display the first seismic powers' capability worthy of the name as tenacious secular bird figures [1].

The intensity of the Japanese earthquake is equivalent to 20 WenChuan Earthquake, said Guo DingPing, a professor in the International Relations College, Fudan University and the director of the research centre of Japan, the successful experience for Japanese to take precautions against natural calamities and earthquakes, on the one hand, is the advanced technology and on the other hand, is the long-term unremitting success of national education. Japan has realized the disaster-reduction education fully covered by bringing it into the national education system and connecting school education with social education.

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2 Necessity

China is a country with the most serious earthquake disasters in the world as Japan. How should we draw lessons from Japan's earthquake to prepare well for disaster prevention and mitigation? The white paper “China's Relief Efforts” points out, starting from 2009, the state will reinforce school buildings nationwide in order to make them meet the earth-quake withstanding standard applied for key projects within three years. They should also meet the requirements in preventing and avoiding disasters caused by mountainside landslide, rock collapse, mud-rock flow, tropical heat wave, fire, etc [2]. The state has set up Disaster Prevention and Mitigation Engineering (DPME) to meet social development need and has trained successive graduate students. DPME is one of secondary disciplines in civil engineering, which is important for implementing sustainable development strategy in China. The primary missions are: building and developing the scientific theories, design procedures and project measures for engineering structure and project to resist natural disasters and man-made disasters, minimizing damage caused by future disasters, guaranteeing people life and property safety, guarding the post-disaster economic recovery and development ability, enhancing disaster prevention and mitigation capacity of national key projects [3]. In which mitigation professionals act the key roles. How to apply the theoretical knowledge fully in practice is worth discussing and an urge demand for professionals of this field in the circumstance that disasters are frequent over the whole world nowadays.

Strengthening the practice education on DPME makes postgraduate in this field understand national condition, link theory to practice, improve the ability to solve practical problems and conduct innovation research on the problems and insufficiencies in practice, which not only increases the research interest , the results are also applicable. The equipment and facilities in practice teaching are open to public and society to fully understand the occurrence and development principle of disaster, to strengthen their consciousness and increase the whole social capacity on disaster prevention and mitigation.

A majority of colleges and universities that set up DPME career have practice credits requirements, whereas the commitment is not good for various reasons, that is postgraduate students’ ability to apply the theories to practice and the social environment requirements has certain difference. Therefore, strengthening the practice education is an important and urgency measure for higher education to adapt to the social economic construction and development needs initiatively, especially for DPME career.

3 The Measures

3.1 Education Combined with Examples

First, the knowledge on DPME career is strong practical. It should be emerged with multimedia and visual picture to display the occurrence and development principle of kinds of disasters and the basic escape methods, which not only

arouses the enthusiasm of students to study, but also makes them have a full understand of disaster and improves the knowledge absorption and use degree in the real disaster site. Second, universities should let the students know and understand comprehensively the risk of earthquake and fire and the necessity of an-seismic and fire prevention with different local conditions in various disaster sites under safety. On May 12th 2008, an 8.0 earthquake occurred in Wenchuan, Sichuan Province in China, caused heavy losses to the lives and property of the people. All the postgraduates in this career in my school went there to participate in certain relief and conduct a lot of scientific investigations. In the realistic example classroom, the students proceeded more scientific and effective rescue by using the professional knowledge. They also achieved much by innovation research on many academic blind spots found in the earthquake. Master thesis' quality had improved a lot. Above all, their spirit got baptism in front of natural disaster, and they understood the major responsibility over their shoulders, which will be engraved on their memory all their life and propel them ceaselessly.

3.2 Disaster Drills

An-seismic drill becomes commonplace in Japan either at school or company. The Japanese get calm down soon after calamity. The victims show a high level of self-help and mutual aid awareness; they are orderly no matter taking refuge or accepting radiation check. The principal of Sangzao high school, Ye ZhiPing insisted on earthquake exercise before WenChuan earthquake to make his students survive in such a big disaster, in contrast, other school is the horrifying scene. The public voice is propagating the importance of strengthening drill after every disaster, it is until so far that the Chinese is not know the truth that never too late to mend.

Disaster drill is an important part of practice teaching for postgraduate in the DPME career. It should include two levels: one is the drill for postgraduate organized by tutors, which aims at testing and reinforcing the elementary disaster-reduction knowledge. The time and place and the type of drill can be on the basis of course content. In order to enhance the drill quality, make teachers and students take it seriously, the droll condition should be included in the course grades. Afterwards, the teachers should comment one by one and conduct reinforced drill in where people make relative more mistakes to solid learn, fully understand and apply correctly, which also prepares well for the second level. Two is the droll for the native department and school conducted by the tutors and postgraduates majoring in DPME. It is an event, needing sufficient preparatory work, such as rigorous plan, organizing and leading. Schools and related departments should give active cooperate. To make it, the necessary scientific lecture and drill guidance should be conducted for the whole school before drill, while there are professional summarize after it, and postgraduate explain and correct more details. The drill in this level should be made when the majority of the students are in classroom or in dormitory.

Though the drill of each level causes a certain losses of material and financial resources, there are not adequate mental preparation and physical preparation too

much to prevent disaster reminded by the tremendous destructive power of 3·11 earthquake in Japan. Only to master to think ahead and put disaster prevention education through daily practice teaching, can we really improve disaster prevention and mitigation capacity, can we talk about the respect for life and the promoting growth of life to realize the purpose of train a person through education [4].

3.3 Establishing Popular Science and Exercises Base

The most economic and efficient way is to establish popular science and exercises base to realize the systematization and normalization of case study teaching and disaster drills. The base' location, size and service standard should comprehensively consider the following factors: geography, population density, universities, distribution of universities scientific research institutes and so on, which is a significant issue and should be examined and finalized by professional. The base has the education and practical function. The opening to public of its scientific and technological resources, for examples research facilities, can not only popularize scientific knowledge on disaster prevention and mitigation, but also combine theory and practice to apply learned concerned knowledge to deal with the proper danger and risk during the disaster process in the simulative scenes, which benefits to enhance the public consciousness on disaster prevention and mitigation [5].

Nowadays, many scholars emphasis school safety education should set up the concept "macro-security", that is, on the one hand, school must guarantee students to familiar with safety knowledge, take in corresponding security training timely and organized, have survival self-rescue since protect ability; on the other hand, life safety education system should be formed with students at the centre and including family inside to ensure everyone can survive in disaster [6]. So the practice teaching on the DPME career shouldn't be limited to school, which ought to bear certain social responsibility to make an indispensable contribution to increase the whole society's disaster prevention and mitigation capacity.

3.4 Volunteer Team Construction

Volunteer service gets more and more popular with the development of China's modern social public career. Participating in volunteer service help people take a leisurely life, undertake public responsibility, enlarge acquaintance, establish social trust and so on, in which social atmosphere and conditions, it is on autopilot that conduct volunteer team of teaching and practice on disaster prevention and mitigation. The volunteer team is not confined to professionals, social warm-hearted public figures should be included, and who can strengthen their ability to cope with disasters through such voluntary service items. And it benefits to popularize and spread the disaster-reduction knowledge by giving full play to the strength of society.

The volunteer team organized by postgraduates on DPME career will have profound effects on disaster prevention and reduction activities in modern society under the "macro-security" idea, the reason is unbalanced teaching work and not covering all the people. So the volunteer team can go further to places where they

are needed most at the same time as improving educational environment in country, which is the extra-curricular extension of practice teaching and implementation of social responsibility for people majored in DPME.

4 Conclusions

It is not expect the accurate disaster prediction for disaster prevention and mitigation. The daily effective details training play the role. Be vigilant in peace time and lay up against a rainy day. President Hu JinTao said in the speech to mark the anniversary of WenChuan earthquake" To enhance disaster prevention and mitigation capacity is essential for protecting people's lives and property. It is also a major task facing the whole mankind".

It is a long-term viable subject for disaster prevention and mitigation intimately related to economic construction and technology progress, at the core of which is anti-seismic, wind resistance, fire resistance, and blast resistance project and so on. It has a very important role in implementing the strategy of sustainable development. According to the research of practice teaching, the system of science on disaster prevention and mitigation can be perfected, the specified work can achieve the goal to make rationality and economy consistent with safe reliability, a group of high level talents engaged in the scientific application of anti-seismic and disaster reduction can be trained and brought up at the same time which has important significance to the construction of the national peninsula and the science and technology industry parks.

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Experiment on Students' Expression Ability Affected by Language Meme Training in English Classroom

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Abstract. This paper takes random experiment design and lets English learners practice Genotype Meme and Phenotype Meme on the basis of Language Meme theory to check the effect of Language Meme Training on students' expression ability. The experiment result shows that this training has somewhat significance on students' expression ability and promotes the way of thinking in English. Additionally, students in different levels earn different benefits while the experiment effectiveness of Genotype Meme training is superior to that of Phenotype Meme training.

Keywords: language meme, Meme training, Oral English.

1 Introduction

Richard Dawkins in Oxford University proposed the concept of Meme in the first unit of *the Selfish Gene* in1976 firstly. Meme has a variety of domestic translation, ZiRan He, a professor translated it as "Meme", he said that Meme is a phenomenon similar to gene as well as a unit of cultural transmission different from one to another. *The Oxford English dictionary* defines the Meme as the basic unit of culture which imitates to transfer. These two definitions consider that Meme is the copy of cultural information by imitating. Meme includes Genotype Meme and Phenotype Meme. Genotype Meme realizes self-replicating and spread as continuing imitation of various information at various forms, while Phenotype Meme as a language form and accordingly is embedded into different information contents.

Language memo can be imitated, repeated and employed. This process must have three factors: firstly, the repeating should have similar priority compared to the original language. That is to say, memo isn't changed and transmitted to another media or a certain person; secondly, it must be productive. That is to say, language memo is replicated continuously and transmitted, the faster it replicates, the wider it transmits; thirdly, it has longevity. That is to say, language memo can be transmitted constantly. Additionally, language memo should go through four processes such as simulation, memorizing, expression and transmission which are four continuous and deferent stages. Simulation refers to a efficient memo which

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can be sensed by a certain media and can be noticed, understood and accepted. Memorizing refers to the memo must be kept in memory for a certain period. The longer it keeps, the more chances it will influences the media or person. Expression refers to output of language memo from mother media and be injected into sub-media. Transmission refers to the platform which helps language transmit from one source to another source. The platform is stable and cannot be changed easily which can prevent the information from changing.

The Meme effect based on English conversation depends on many factors such as English vocabulary, thinking mode, language settings, social culture and restrictive rules etc. If $C = f(x, y)$, C represents the conversation outcome, X represents conversation factors represents independent variables which influence the conversation outcome. From the formula we could see conversation factor plays a key role in conversation outcome. The factors are pronunciation, intonation, rhythm, word order and logical relationship which are limited by the certain language rules. To improve the second language learners' English expression ability and mastering these restrict rules are urgently essential. However, Language Meme training can help solve these issues. Viewing home and abroad research about language meme, the research mainly stays on the theory level and is mainly concentrated on writing-meme training and translation-meme training research. The oral meme training research is little, and combining the two types of Memes together as a paradigm research even less. According to another investigation, there is no meme training experiment research in China at present. Based on the above factors, this paper proposes that language meme paradigm training has a good effect on the development of expression of students.

2 Design of Experiment

This experiment is conducted with 90 fresh students in Applied English Major in the International Study, Zhejiang Business Technology Institute. It adopts random design, and takes Class 1021 and 1022 as experimental classes while the Class 1023 the controlled class according to the results from college entrance examination. The gender, age and teaching experiences in these classes are nearly alike. In English class 1021 and 1022, teachers employ teaching method based on Meme to instruct in a purposeful and well-planed way. However, students in Class 1023 are taught with normal ways. The textbooks adopted by this experiment are the P*ractical Vocational English Dialogue* and *Vocational Typical Oral English* which are both published by Zhejiang University Press. Through the confirmation of several English experts, the teaching materials are considered to be suitable and practical. We aim to improve students' oral English through the changes of our training method in the condition that tasks are unchanged. The test procedure is as following.

2.1 Pre-test

In order to ensure the elected students can participate in the experiment willingly and make the experiment reasonable, we need to get knowledge of students as the center of this experiment and identify the real situation of students, which can

make the pretest of experiment design efficient and valuable. The experiment is designed by related teachers and carried out by teachers as well. Therefore the teachers have more privilege than that of students. Based on this, to carry out experiment pretest can get knowledge of the past experiences, background and English levels and the needs as well. To some extent, successful pretest can help us get proper experiment strategy which is applied to teaching and learning rule. Before experiment, the more we consider, the more efficient the experiment is.

The materials used in the pre-test are unit 1, unit 4, unit 6 in Practical Vocational English Dialogue which are all highly representative. First of all, we invite three American teachers to have a test on the students' oral English. The test is carried on in the simultaneous interpretation laboratory. Students are requested to finish reading in 5 minutes and record their own speeches. In this process, two teachers are responsible for the record, and the other one controls all the variables such as discipline in the test room to ensure that the test is carried out in compliance with the stated regulations and standard. The students must leave the laboratory immediately after finishing recording his or her own speech, and then the three foreign teachers give scores to the records through playing them at the same time. The test is conducted in the laboratory without any subjective interference, which ensures the fairness of the examination and judgment.

In English Class 1021 and 1022, teachers use the Genotype Meme and Phenotype Meme methods to teach while the ordinary method for controlled class. We select three teachers who are similar with each other in terms of diploma, teaching experiences, responsibility and organizing ability for three classes. Before the experiment, the three teachers have been trained about the theory and teaching method of Meme so to make the teachers grasp the operating strategy of Meme training. In the controlled class the teacher adopts routine teaching method without any Meme training instruction. In pre-test,

2.2 Post-test

The materials used in the post-test are the oral materials from Vocational Typical Oral English. We select two typical units and plan to make the post-test at the end of the first semester. The post-test includes the followings: (1) Whether there is distinct disparity in oral English between the controlled class and the experimental classes.(2)Whether the Meme training methods contribute to the model of English thinking. (3) Whether students of different oral basis will benefit differently. (4) Whether there is difference between Genotype Meme Practice and Phenotype Meme Practice. First of all, Class 1021 is made to have the Genotype Meme training and Phenotype Meme training for Class 1022.

The key points of the Meme training includes: (1) Meticulously select the materials which can be accepted and comprehend by students better to increase the success rate of Meme duplication. The successful Meme is of fidelity, multi-reliability and long-duration. The Meme depends on its communicative function in the real situation. So if oral English can be spread widely and play positive roles in communication, students will duplicate and transmit them better. And the Meme can be more vigorous and lasting. (2) Explain the language knowledge in detail

and enrich the basic Meme bank. Especially some industry which has its technical vocabulary, meaning and expression, and it has its own grammar system as well as nonverbal aspects. Once a certain language is confirmed to be Meme, the teacher should teach and train the students time and time again, establish and improve the basic language Meme bank to strengthen students' sense of language. (3)Enhance recite and maximize the Meme storage. Reciting helps to gain fidelity, duplication and long memory and makes the Meme successfully duplicate and transmit. The process of reciting is actually the necessary step to upgrade the perceptual knowledge to conceptual knowledge. (4)Encourage creative imitation and enhance the adjustability of the Meme. Meme's fidelity and duplication emphasize the positive influence of mimicry in English language study. But we are not living in vacuum and we need to contact concrete language situations and scenes. Only by expressing thoughts according to needs at any time, can the Meme training be significant and worthwhile. On the above 4 points, the Gene Meme and Phenotype Meme have their particular emphases. The Gene Meme training is drilled through direct application and different words of same meaning. By contrast, the Phenotype Meme is through the association of the same words through formation of different meanings.

3 Result of Experiment

3.1 Result of Language Meme Pre-training Test

This test is completely random designed. In the pre-test, the statistics of single factor variance show that there are no significant differences between the experimental class and the controlled class, so that it is believed that the class division is reasonable. In addition, this also shows the students in two classes are no radically different in character, interests and wisdom. If this experiment is dealt with properly and reasonably, the result from this experiment will be reasonable and valuable, which is helpful not only to language study but also to language teaching as well. Therefore, the experiment group think that to carry out this experiment is worthy and strategic to language acquisition. Before experiment, we consider it over and over and list many factors which will influence the experiment result possibly. Furthermore, we also suppose that if students show no interests in this game and will not participate this experiment, if this situation appears, we should get our experiment as easy as possible and make it acceptable not only by students but also by the teachers involved.

3.2 Pre-test and Post-test Results for Oral English Test

Does the oral English proficiency of students improve after one semester meme training? In order to answer this question, we conduct the post-test for both the experimental class and the controlled class to measure students' oral English proficiency.

In accordance with the analysis of *sample T*, we find remarkable differences between the pre-test and the post-test of both two types of classes after meme

training and conventional training. There are two reasons for this. On the one hand, it is due to students' self-study and subjective initiative. Students have experienced the College Entrance Exam and just enter the college. Their aggressiveness, strong sense of responsibility and ambition urged them to work hard, so that their achievements improve apparently. Another reason might lie in that the new training method actually plays a role. Students feel it is innovative, and of course their self-confidence is greatly enhanced, and the oral English proficiency is improved. Which one of the two reasons is decisive? In order to answer this question, we analyze the statistics of the post-test. The results of single factor variance show that there are significant differences between the experimental class and the controlled classes. That is to say, after meme training for one semester, the oral English proficiency of students in test classes is apparently improved. We also conduct *LSD multiple comparison* to see if the students' proficiency of both the experimental class and the control class remarkably.

The P value in LSD multiple comparisons is as follows respectively; *P1=0.045 < 0.05; P2=0.000<0.01; P3=0.000<0.01,* which mean that there are significant differences among Genotype Meme training, Phenotype Meme training and the conventional teaching. Therefore, Genotype Meme training or Phenotype Meme training is much more effective than conventional teaching. In addition, Genotype Meme training is also significantly much more effective than Phenotype Meme training.

In order to prove that language meme training has a positive effect on training of English thinking mode, we select exercises of two most representative units from above publications as the pre-test and post-test. An English thinking mode test is conducted after language meme training of one semester. In accordance with the analysis of *sample T*, we find remarkable differences between the pre-test and the post-test for both two types of classes after meme training and conventional training. There are two reasons for this. On the one hand, it is due to students' self-study and subjective initiative. On the other hand , meme training may probably play a role so that students' oral English proficiency improves. Also, we analyze the statistics of the results of the post-test to prove that the second reason plays a decisive role.

The results of *single factor variance* show that there are significant differences between the experiment and the controlling classes. That is to say, after one semester of meme training, the oral English proficiency is apparently improved and English thinking mode is sharply formed. We conduct *LSD multiple comparison* to see if the students' proficiency of both experimental classes.

The *P value in LSD multiple comparison* is as follows respectively; *P1=0.029 < 0.05; P2=0.000<0.01;P3=0.000<0.01,* which elaborates that there are significant differences among Genotype Meme training, Phenotype meme training and the conventional teaching. Therefore, Genotype Meme training, Phenotype Meme training, and conventional teaching are all effective in forming English thinking mode. In addition, Genotype Meme training is also significantly much more effective than Phenotype Meme training in the same aspect.

In order to identify the benefit of language meme training for different level students, we divide students into high-scoring group and low-scoring group

according to the pre-test scores before language meme training. The students whose scores are lower than the average scores are in the low-scoring group, and others are in the high-scoring group. According to the comparison between the high-scoring group and the low-scoring group, we discover that in Genotype Meme training, the benefit for two groups is significantly different, since $t=4.45$, $P=0,003<0.01$. That is to say, the low-scoring group benefits are more than that of high-scoring group. While in Phenotype Meme training, $t=2.35, P=0.157$,which means the two groups have no apparent differences.

4 Discussion

Firstly, language meme training provides with reference for students' expression improvement. It is considered to be determined by the innate traits of language meme that students in the experimental class perform better in expression than those in the control class. Learners internalize memes from weak situations into strong ones through imitation, reproduction, repeated memorization and final application, which results in the strengthening of the proficiency of language. In this case, teachers can create environment to meet the demands of this training. This kind of setting is essential for fresh students who are not familiar to the second language study. According to some tests and study, experts think that students who will learn a certain language can be easily to accept this new model of language acquisition. Therefore, in our daily teaching, we should endeavor and manage suitable settings for students.

Secondly, language meme training is helpful for cultivating of students' thinking models. Language meme's replication, application, changing, imitation and transmission are fulfilled through human minds and language. On the one hand, Output caused by meme helps learners' digestion and absorption of information and encourages learners' correct expression rather than vague understanding. On the other, Learners' repeated practices consolidate meme extracted and their language output abilities. Gradually, English thinking models have generated. Actually, this acceleration effect is under expectation and this experiment just proves it. To be honest, the second language thinking model is hard to cultivate and form for foreign students. The following reasons can support this. First, Language acquisition background is different. For overseas students, they grow up with company of their parents and relatives, and get education from native teachers, so they form a fixed habit of speaking and listening, and of cause, they cannot change their own thinking model because they must communicate with mother, father and people around them. They ask for food, water, bread and rice and form a habit which they think is natural and necessary, and is accepted not only by themselves but also by their parents, and the society around them.

Thirdly, learners with distinct language levels benefit differently from the training. Students in low score group gain more improvement than those in high score group. It is possible that high score group students only learn and apply language meme from theoretical aspect, which results in their smaller improvements. The other possible reasons are the following. Those students in low score group are interested in this training model and study harder than those in high score group. In

addition, students in high score group are very familiar with the former language acquisition approach and need a long period to accept a new kind of language study approach. What's more, students in low score are satisfied this new type of language study because they found the secrets and made great progress in a very short period, so they will invest time, energy even money to master this model. There is no question that they want to improve themselves by employing a new model of language acquisition and they realized their own dream when they found one achievement by another.

Finally, as revealed by the experiment, the result of Genotype Meme training is better than Phenotype Meme training. The probable explanation is that genotype meme training is only involved in the surface layer and fundamental stage in language meme training and is easy to handle, while due to the internalization process of phenotype meme training, it costs a relatively long period to see the effect. So in a short-time training period, the former one is more likely to have better effects and turns out better outcome than the latter one.

5 Summary

According to the experiment, the following conclusions are developed:

Language meme training is helpful for cultivation of students' expression abilities and Language meme training contributes to students' English thinking model. Meanwhile, Students with distinct language levels benefit differently from language meme training and the experimental outcome of Genotype Meme training is better than that of Phenotype Meme training as well.

The scale of this teaching and learning experiment is small and the design is not complex, but the result of experiment enlightens our thoughts and makes sense. This experiment shows imitation ,reciting and retelling are valuable approach which help us remember language knowledge, cultural differences and improve our expression ability and comprehension capacity; in our country, owing to the lack of the basic factors of language study. Learning a certain language is only conducted by skill training which is not sufficient. It is better to employ imitation, reciting, repeating and retelling and combine them together sometimes which will improve the learner's comprehension and expression ability finally. The experiment also told us repeating is essential of mastering a certain language, through repeating, memorizing and application which really enhance the improvement of English language. In short, the approach which can help put language into practice is the best way. Memo training works.

Nevertheless, this study has some limitations and many shortages which include: the subject is only limited in our own institute and the number of students is very small which cannot represent the majority of students. Secondly, the conclusion is influenced by many factors and therefore biased; thirdly, the methods involved need further systematic and scientific change. Therefore, we should carry out deeper study in this field.

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The Main Problems of Learning Style Construction in Institution of Higher Education

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Abstract. In view of the main problems of learning style in institution of higher education at present, the author analyzed them from three aspects, i.e. students, schools and society. For students, the problems includes the drop of students' quality, the indifference of professional thoughts, the tendency towards utilitarianism of learning motivation, the weakness of cognitive ability and psychological quality, and restricting factors from family, etc. For schools, the problems lie in the challenges in the management of higher school students, the backwardness in teaching management and the harmful effects of learning style, etc. For society, the problems consist of the effects of employment policy, the negative influence of market economy, social corruption and unfairness, and the influence of Internet towards learning style, etc.

Keywords: Institution of higher education, learning style construction, problems.

1 Introduction

In the past two years, we found tendencies of growing rate of failing in exams, and increasing number of academic probation and drop-out. We know that not a few students have the bad habits of learning underpowered, ambiguity in learning goals, truancy and addiction to online games. In order to understand the students' practical learning situation and look for the problems, we made an investigation on learning style among the students to improve their learning and strengthen the construction of learning style. Through the investigation, the author summarized from three aspects of the main problems of learning style construction in institution of higher education.

2 The Problems Existing in the Students

Students are the main body of learning style construction, which is affected from students' quality, which determines the quality of learning style to a great extent.

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2.1 Ambiguity in Learning Goals

Learning goals refer to one's cognition and pursuit of the social significance and function of learning, which reflect one's ideal and aspiration in learning.

According to the survey, some students are not active in initiative and enthusiasm, and hardly concentrate on learning and seldom set strict demands on themselves; some students study for diploma only; some study for scholarship; some students learn blankly and just cope mechanically; some learn for repaying their parents; and even some students are in a state of "non-purpose" in learning. These all directly affect the school's learning style and the students' mental outlook.

2.2 Slack in Discipline and Bad Learning Habits

Some students often come late, leave early and play truant, especially in public courses and situation policy education courses. Even in specialized courses, students are insufficient in energy. In addition, it is common that the students do not listen to the teachers carefully. Some students listen to the teacher depending on their interests. They may doze, or read other books, or whisper, or daydream, or listen to music by headphones, even bury in playing games. In the long run, these students will develop a lazy study habit.

2.3 Instability of Learning thought and Insufficiency of Learning Atmosphere

Nowadays, most of the college students are the only children in their families. They are active with strong self-centeredness. They are diligent in thinking and eager for success, but lack of spirit of hard-working. Because of little frustration they had experienced, their psychological quality is fragile. Moreover, after entering college, they will face competing pressure, learning pressure, interpersonal pressure even economic pressure, resulting in their considering too much, their mental load too heavy, and their frustration too easy. Even some students are addicted to Internet, forgetting learning. Kinds of emotional swings lead to variation of students' learning attitude and instability of their records of studies, and then the learning style would be affected negatively.

3 The Problems Existing in the Schools

The school is the main place of students' living, influencing the students directly. The school mainly affects the learning style construction in the following respects:

3.1 Innovation in Student Management Is Expected

At present, one of the main problems of student management is that high school student management system relatively lags behind the requirements of the market economy. The content of the student management is growing, and part of the

management function is transforming into service function. College students' employment is changing from planned distribution to self-dependent career choice; fixed schooling is transforming into flexible schooling; the aid to those students in economic difficulties is changing from grant and allowance to student loans and provision of part-time jobs, etc. The series of changes need a new complete student management system to ensure its implementation; however the establishment of the system has not yet fully formed.

3.2 Theory Teaching Breaks Away from Practice and Teaching Method Is Single

In the investigation, it can be found that teaching is an important factor in the construction of learning style. In institution of higher education, no matter what levels they are, teaching content should be practical as much as possible, combining its application. Combined with practice, teaching can not only make the teaching lively and interesting, but also help to cultivate students' ability to solve practical problems.

3.3 Practice Teaching Force Is Weak

Experimental courses is mainly dependent on theory teaching, and the experiment setting up as the lesson alone is few in number, which takes a small percentage in exams. It results that the students stress theory more but ignore practice, and then students will neglect the importance of practice teaching.

Many experimental teachers are not professional personnel, some are lack of experience, and some are poor in theory. It makes difficulties to in-depth teaching, and students can only do experiments on a low level. All these are unfavorable to cultivate students' practical ability and innovation awareness.

3.4 Examinations Still Need to Be Strengthened

As an important part of teaching, exam has a direct effect on the learning style construction. Generally speaking, strict management of exam links will promote the style construction; instead it produces adverse effect to the style construction. Take our university as an example, through grasping exam management, exam style construction has improved significantly, and has made remarkable effects. Here the exam links refer to the overall process related to exam, including teachers' exam questions, pre-exam review, pre-exam organization, review papers, sum up scores, etc. If a certain link has problems, it will directly affect the result of the exam and the construction of learning style. A few factors will influence the positivity and enthusiasm of students' learning, such as the degree of difficulty of the exam papers, the size of the range of pre-exam review, the organization and discipline of the examination, the degree of strictness of papers' review, the proportion of school assessment marks take in the total score, etc. Therefore, we will improve the test management strictly and do well in teaching; in the meanwhile, we will make educational measurement scientifically as well as accurately.

4 The Influence of Social Environment

Institution of higher education is an important part of society; as a result, the construction of learning style in institution of higher education is impossible to be the only affair inside the institution. Except that, some of the unhealthy ways and customs in society will also produce negative impact on learning style construction. Firstly, students are affected by corruption and unhealthy tendencies in society in a great deal. Students are very angry, objectionable, and confused to these phenomena. Secondly, the students' motives of learning are weakened by the unfair social distribution and low salary of the intellectual. Some students envy the singers and movie stars with fame and wealth, expecting to be rich overnight; they think that it is too far away to realize their economic value through more than 10 years' perseverance in study. Thirdly, utilitarianism and "fast-food culture" affect students to give up the fundamental factors emphasizing the trifles only, and unable to bear the loneliness of learning. Some students hope to engage in economic activities to get better economic compensation as soon as possible. On study, utility tendency is also reflected in taking function seriously and foundation neglected, taking economy seriously and theoretical knowledge neglected. Fourthly, employment is in a difficult state. It is hard for the graduates to find jobs. The growing enrollment in higher schools in the successive years increases graduates' employment pressures. The employment of graduates appears false saturation with talents' high consumption. Together with the unfair competitiveness in employment, these factors cause certain difficulties in graduates' job-hunting, and make them have a negative pessimistic mood.

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Exploration of Engineering Education Reform in New Application Oriented Institutions

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Abstract. The article points out direction of engineering education reform, and problems of engineering education reform in new application oriented institutions. Such as project consciousness is not strong, training models is single, innovation practice ability is not enough, and overall quality need to enhance. In view of these problems, Proposing thinking of engineering education reform, and practice in other universities.

Keywords: Application, Engineering education, Reform.

1 Introduction

Since the founding of the People's Republic of China, engineering education has cultivated tens of millions of engineering talent, it has strongly supported the formation and development of chinese industrial system, and has made important contributions for socialist modernization drive. But compared with developed countries, china is shortage of technology leaders and senior engineer. Since seventeenth national congress of the communist party of china, party central committee made important instructions of new path of industrialization with chinese characteristics and construction talent powers. In the new situation, engineering education reform became the focus of universities.

2 Existing Problems of Engineering Education Reform

2.1 Project Consciousness Is Not Strong

Chinese engineering education development strategy is not clear, all kinds of colleges training objectives converge, do not form application characteristics of local applied university. For college students, master the learning skills is more important than the knowledge, while learning styles and strategies are more important than the general learning skills, so an important goal of college is let

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students learn to learn. It is the training goal that all colleges pursuit of. But it is different when it implement specific, especially the training pattern of firm basic theorise and wide knowledge is proposed, different colleges has not the same understanding of basic. Most local applied university consider basic is discipline basic course, then humanistic is also considered as basic. They all overlooked an important concept capacity, this capability includes innovation and practical ability, project consciousness is not strong in training goals, lead to innovation ability and practice ability can't satisfy the business requirements, make students obtain employment difficult. The growing world needs more and more high-quality engineers, need they have great innovation ability and the understanding of the world, to achieve this goal, we will re-enact personnel training objectives, enhanced awareness of their projects.

2.2 Training Models Is Single

Students' innovative consciousness and innovative capability are not strong, goal of engineering education is to train the best engineers, the traditional engineering education still train talents according to professional. In the training program, many required courses, few students self-selected lessons. Training plan is copied directly when it is formulated, no research and analysis. Copy the old training program, make talent specifications single, no innovation spirit. Currently, many colleges, training model has begun to explore the diversified training model. But in the actual process, there are still many problems.

2.3 Innovation Practice Ability Is Not Enough

Our undergraduate engineering education attach importance to professional knowledge, not practice ability. The students don't know how to apply the theory knowledge to practice. It is different from industry demands for qualified personnel. The reason for emphasis on engineering education experience is that engineers can not simply theoretical knowledge, the need to rely on experience to identify problems and find solutions. Thus. The practice of engineering education is the emphasis on the workplace environment into the educational and break through the boundaries of classroom teaching environment, To provide students a place to create engineering design. Provide students more opportunities to get experience of solving engineering problems and get more platform of engineering practice.

2.4 Overall Quality Need to Enhance

Engineering education cultivat innovative engineers for china, excellent teachers is key to the success of this reform. Many teachers simply put the book only impart to students, lack of innovation. Teachers with strong researches focus only on scientific research, but also ignores the innovative sense of students. Young energetic teachers often lack some practical experience, not in business experience. Yang min refer to that at present china needs a large number of teachers who not

only understands engineering theory but also understands practical engineering and pedagogical engineering. one hand, we need to strengthen teachers,s practice training, improve their understanding of industry development needs and talent and innovation, on the other hand, we need to strengthen the education and teaching methods of training, change the traditional teaching idea, redefine the roles, in order to improve teaching ability and level of education reform. Ultimately reach the standards and quality requirements of engineering education on teachers.

3 Thinking of Engineering Education Reform

3.1 Strengthen the Awareness of Engineering Education, Training Engineering Talents

Cultivating innovative talents of engineering education must have a strong sense of innovation and engineering education, Otherwise, an innovative engineering education is only on paper. We should strength"the concept of engineering education", consolidation and development school,s characteristics. and estab the guiding ideology of " heavy knowledge, strong ability, high quality ". Applied undergraduate cultivation grass-roots technical application talents. emphasize that apply their knowledge directly into practical. Therefore, engineering talent is different from general engineering personnel and research personnel. The innovation of personnel training mode should be market-oriented, in the modern society of the high-teach industry, Training to solve practical issues, to maintain the normal operation of the work of higher technical talents in industrial, production of engineering, construction, management, service. graduates have a solid professional knowledge, with a strong practice and innovation and have higher comprehensive quality. After graduation they can engaged management work with the high technological content, comprehensive and strong technical in industrial, production of engineering, construction, management, service.

3.2 Innovative Training Model, Deepen Reform of Curriculum System

In addition to the existing "sino-foreign school", "the school-enterprise cooperation", "intercollegiate exchange" training mode. The more should pay attention to the whole school curriculum system settings. Strengthen the Content of engineering education, innovative training model. Curriculum system settings is the core content of the training plan, curriculum system should have the following characteristics based on engineering education concept: the first, In knowledge, not only have a certain breadth of knowledge, but also a certain depth of knowledge. Practice-oriented talents in local colleges should not only have the solid specialized knowledge, have the perfect applied knowledge, have certain scientific cultural knowledge and related management knowledge in basic theoretical knowledge, but also to achieve

considerable depth. The second, In capability. They should both have strong technology application ability, and have strong ability to innovate. Talents training focused on the mature technology and standard as the foundation, cultivating students' competence of some occupation post occupation skills, skills and ability to use. application oriented undergraduate talent more emphasis on theoretical knowledge and technical ability, emphasizing to solve specific technical problems in practical production, especially the application of knowledge to carry out technical innovation and technology development two times ability, more emphasis on students' autonomous learning ability and post adaptation, the forming of students' ability of sustainable development. The third, In the quality aspect, they should both have higher professional accomplishment, and should have non-specialized quality. The combination of Scientific literacy and humanity is the embodiment of the Practice-oriented talents, high-quality. In engineering design, technology development, production management process, the use of professional knowledge, skills are often associated closely with engineering and technical personnel quality of body and mind, sense of responsibility, sense of morality, will quality non professional attainments. These non professional literacy directly affects the work efficiency and quality of engineering and technology, therefore, general local universities engineering application undergraduate education avoid the "professional skills, light integrated literacy", attach too much importance to human technology value, tool value, ignored human self development value, human value, from the one-sided emphasis on the students' occupation quality change and comprehensive quality.

3.3 Curriculum System Use Point, Line, Surface

The point course includs the humanities and course in accordance with their own interest, specialty. line course is specialized core curriculum, strengthen the professional and technical ability. surface course is practice teaching. The relationship between the three can use a figure 1 express.

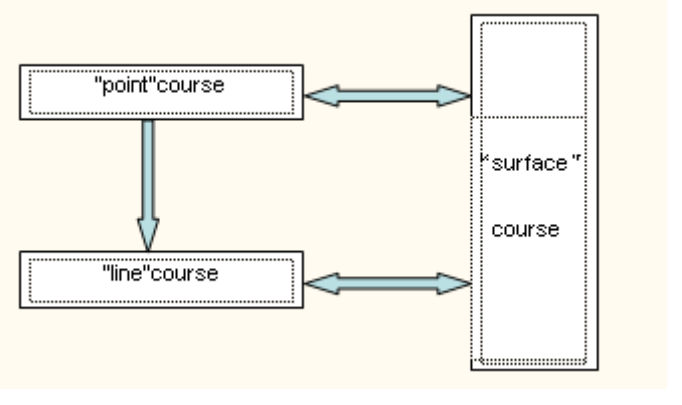

Fig. 1. Relationship between point, line, surfacecourse

Poine course improves students' comprehensive quality, including the all the theory courses outside of the professional core courses, services for the line course. Line course to improve students' professional technical ability and innovation ability, causes the student to have the solid specialized knowledge. Point, line and surface course are the relation that promotes each other, also the complementary to each other, learn in order to practise, discover a problem in practice, use the knowledge to solve problems, training innovation ability in the process of founding problems , improving the self in the process of in solving the problem. In practice the use of the whole learning process secondary to knowledge, It is a comprehensive to use the whole knowledge in practice. According to the curriculum idea, courses can be divided into general education, professional basic course, the professional core courses, practice teaching several platforms, each platform set compulsory and optional course, so that students have sufficient choice room.

3.4 Improve the Quality of Teachers

The first, teachers should have a certain ability to integrate the curriculum, curriculum design and curriculum development, guide the students change learning styles, establish and form the learning way of fully mobilize, exerting students corpus. The second, to improve the structure of teachers. For local applied undergraduate colleges, it is very important that teachers have engineering practice. college should select some excellent teachers into corporate to study. Meanwhile, college should also make full use of the favourable conditions of university-industry cooperation, employ professor with rich practical experience, make the team normalization, systematic and standardized.

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Research on the Education of Application Type Undergraduates Majored in Engineering

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Abstract. Based on the demand structure of the capabilities of talents by the engineering enterprises, this paper analyzed the current education situation of institutes aimed for application type graduates. According to the demand of talents being useable for the society, this paper proposed that the goal of Applied Mechanics should be the education of mechanical engineers and technologists. Education with special characteristics should keep raising education quality, innovating education content and developing education depth.Higher education in China developed fast after entering the 21st century. Many technological academies and universities have been created and upgraded, and this led to a fast-growing number of recruited students. The numbers of recruited students in 2000 and 2010 are respectively 2.2 million and 6.5million, which witnessed an increase of 2 times. The number of undergraduates normally occupies half of the recruited students, which in 2010 is 3.3 million. The newly added undergraduate institutes and universities are in the nature educational facilities. They can also be called application type institutes and universities, which is different from the research type and the educational research type. The application type institutes and universities are closely connected with engineering and have a special characteristic of talents education. They should be place on the medium level of the entire higher education system, which are under the research type and the educational research type institutes and universities, but above technological academies such advanced vocational technologies' high school. Combining the talents education modes and their knowledge structure with the talents demands of enterprises, this paper discusses issues about the major of applied mechanics, the orientation of talents education, the level of education structure and the unique characteristics of talents education. The author's multi-year experience of application type talents education is very useful in the above listed discussion and in classifying the different level of talents need of the society.

Keywords: Mechanical engineers, Education with special characteristics, Education of talents, Education reform.

1 The Social Demand of the Mechanics Major

Mechanical industry is the lifeline of a nation's economy. It produces needed mechanical products for other domains. The mechanics major has a broad application and its graduates are easy to find a job in various departments in the nation economy. Their works could be: products designing, new equipment research,

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development and test; the renewal and upgrading of current products; guaranteeing technological specifications of all the products; products marketing and after-sale technological service or charging the operation and maintenance of equipment in other trades; controlling product quality and managing the production process; participating in the front line spare parts production.

The mechanics major provides talents of all kinds for the society, and different jobs require different structures of knowledge and capability. Research work has a high demand of knowledge breadth and designing capability whilst operational work demands proficiency in operating skills.

2 The Analysis of Current Application Type Graduates Education

There are few newly-built application type institutes and universities. The existing ones are almost upgraded from schools such as technical secondary school and advanced vocational technologies' high school etc. under the development of higher education. Due to the lack of undergraduate education experience, these upgraded schools suffer from inertial mentality of upholding outdated educational thinking and observing obsolete talents education modes, which severely affected the orientation of their undergraduates' education. The advanced and occupational schools have been criticized as shrinkages of postgraduates' institutes and universities which lack their own characteristics. The graduates from these schools become first line production workers.

The connotation of application type is an innovation of concept. Education should serve society, and be connected with productive labor. The core of connecting theory with reality is application. Application has different levels. The sciences becoming technologies, innovation and imitation are all called applications. The word application emphasizes the direct connection between sciences and technologies. It has a strong sense of orientation and a clear purpose. Application is the combination of theory and practice, which pays much attention to the application of engineering and the solution of realistic engineering problems, so it is closely connected with practices. From this angle, the definition of application type of school is more scientific than teaching-learning type of school. It explicitly states the talents education guidelines, which emphasize the urgent hope of transformation from the knowledge of science to productivity, and also suits into the realities and demands of engineering education.

Normally, every city has at least one application type undergraduates' education facility, which is called institute. This kind of institutes is of a large number and recruits more students. They generally have a short history, which means inconspicuous gaps. They long for unique characteristics, high quality and rising influence which will lead to better social celebrity. Hence, they focus on infrastructure building and equipment acquiring, on faculty training and the raising of teachers' quality, and on the research of education/teaching and the fostering of a unique educational characteristics. All these efforts will contribute to the general

strength of application type institutes, quickening their development and raising their standards of running a school.

Taking the education orientation of application type institutes as a whole, besides developmental disparities, they share huge differences in the orientation of talents cultivation, and their directions of running a school is utterly different. Our society worships *solid index*, which makes datum the ultimate standards. The quality of teaching and learning is a *soft index*, which lacks persuasive data. The quality of major education, due to its nature, cannot be compared with each other. So the comparison between different schools, on the ground of basic teaching and learning, is focused on the pass ratios of foreign language tests and computer tests at different levels. As for major education, the number of students who take part in the National Postgraduate Entrance Examinations and their matriculation rate, the number of certifications gained from various skill competitions are used for the comparison and the boost of their celebrity. The cultivation orientation between postgraduates and machine operator is totally different, and whether they conform to the cultivation guidelines of application type talents is a topic deserving further studies. Students in some application type institutes and universities have an extraordinary high rate of taking the National Postgraduate Entrance Examinations and matriculation with high marks. On the one hand, they draw the admiration of other institutes and universities, some of which even follow suit; on the other hand, many *key institutes and universities* and important ones in the *211 projects* dare not recruit them. The reason is simple: the scope of their knowledge is too narrow.

3 The Orientation of Talents Cultivation in the Major of Mechanics

Placed between the (teaching/learning) research type institutes and the occupational technology academies, it is correct for the undergraduates' institutes and universities to locate themselves as the application type. What kind of people should be cultivated? What capabilities should be learnt by the students? And what personal careers should students take in the future? These are the questions that must be carefully dealt with by the educational workers and organizers.

The educational orientation of institutes and universities dictates what capabilities should be learnt by the students; and how many capabilities the students can master reflect the quality of education. Mechanics major in different kinds of institutes should cultivate talents of different levels together for the society. Talents for R&D have a higher demand of knowledge structure, so they can be cultivated by the (teaching/learning) research type institutes; the operation, management and maintenance of machines have a lower demand of knowledge, but a higher demand of comprehensive capabilities, so this kind of talents can be cultivated by occupational technology academies; machine operators in the front line of production, which for now are greatly needed by the society, should have operation skills instead of a large amount of knowledge, they can be cultivated by secondary occupational schools. The mechanics majors graduated from application type of

institutes could go to the medium and small enterprises, solve their technological problems. Their cultivation orientation should be talents of designing type and technologist.

The cooperation between educational facilities to cultivate talents specialized in mechanics at different levels helps to consolidate the status of each level and to foster a sense of responsibility. The application type institutes and universities provide applicable talents for enterprises as project designers and technologists. This could well satisfy the talents demand of enterprises.

4 The Research on the Application Type Undergraduates

The existing complaints about graduates majored in mechanics are: weak work ethics and insufficient respect to their works; the ability to do things, to communicate and to be adaptive is yet to improve; lack of innovative and cooperative spirit. These problems reflect the drawbacks of the educations in the institutes and universities.

To respect one's career and love his/her own work means to be devoted to the job and become specialized in it. Responsibility is closely connected with enterprise. The cultivation of respect for one's career and relevant work ethics is related to education in one's home, in institutes and universities and in society. At the institutes and universities level, to respect one's career and love his/her own work means to love the major he/she choose, and accumulate certain amount of knowledge and capabilities. At present, students choose their major voluntarily. In order to be responsible to themselves, to their family and to the society, they should first complete their study and grasp all the required knowledge, capabilities and qualities. This is an embodiment of the spirit to respect one's career and love his/her own work. However, some students are afraid of hardships and get bored in their study, which leads to shallow learning and affects the foundation of their study. Thus their quality of education has been severely affected. At the same time, in order to foster talents, universities encourage students to have unique characters. But sometimes this kind of encouragement becomes spoiling. Some students make character development as an excuse, and become lazy in their studies. This kind of phenomenon weakens the responsibility education to respect one's career and love his/her own work. Students with a weak foundation of specialized knowledge consequently don't know how to do things, how to communicate and how to be adaptive. This tells us that education quality is the key of talents cultivation.

Enhancing Management, Standardizing Teaching and Learning, Holding Fast the Bottom Line of Quality. The downslide of education quality, the students' lack of responsibility and enterprise are directly connected with university education. Teachers being remiss of students and lacking educational responsibility is the main reason why students lack enterprise and responsibility.

University students without the discipline of their parents cannot control themselves well. Since they cannot adjust themselves to the study in the campus, and are irresistible to the temptation of the internet. And, what is more, university management cannot keep up with the increase of students. University students

easily become addicted to the pleasures from the internet and neglect their studies. Taking teachers into consideration, the increase of students also give teachers a heavy burden. A lot of new teachers are employed by universities, their teaching are of various quality. Some teachers even read through the class or just point out some shallow meanings of the text books. These doings also hurt the go-aheadism of students. Besides, the sluggish observance of regulations and rules made by universities also causes the style of study to become worse and the education quality to drop. Surface indication of high marks in examinations cannot hide these shortcomings. Students formerly being criticized as "low-competency with high marks" are now being criticized as "no-competency with high marks".

Facing the current situation of higher education, we should enhance education management, conduct education quality supervision and evaluation, and introduce the social evaluation system; we should standardize teaching activities on the campus, and build a better team of teachers with good teaching morals and ethics; Application type universities should take trouble-shooting in the enterprise as the center of their researches, cultivate teachers with double capabilities, increase the combination of theory and engineering application and lay the foundation of cultivating application type talents; as for the students marks, we should conduct as early as possible the separation of examination and teaching, conduct examinations according to the outline and majors, and reduce the number of random tests, make them fair, right and objective, ensure they reflect the basic knowledge structure and levels. All in all, we should hold fast the bottom line of education quality and gradually raise it to new levels.

Paying Attention to Theory and Emphasizing Application, Focusing on All Kinds of Designing. Modern education means to grasp sciences and technologies summarized by our forefathers in the shortest time. Modern technologies are guided by sciences, they are products of sciences. We should pay attention to the guiding function of theory to practice, and grasp specialized theory systematically, this will contribute to the cultivation of talents; we should combine theory with practices, and enhance the ability of analyze and solve engineering problems; basic education links such as engineering drawing, mapping and measuring, mechanics theory course planning, mechanics design course planning, mechanics manufacturing technologies course planning, machine bed clamp course planning should be arranged accordingly for the mechanics majors, since they are the main design works required by enterprises and the basic capabilities of application type designers and technologists. During the process of teaching the course, we should combine and connect theory and designing.

Tutors with both systematic theory background and multi-year engineering experience should be selected to instruct our students. Tutors with systematic theory background and tutors with multi-year engineering experience could complement each other in course planning. Attentions should be paid to the practice of engineering design training and practice; mistakes should be corrected according to timely feedbacks; the depth and difficulty level of the designing should be guaranteed in order to control the quality of designing; lessons drawn from the competitive examination, plus the systematic training of graduation design would improve the capability of working independently. The experience of our institute testified

these methods as plausible and effective. Many of our graduates adapt themselves quickly to there new jobs, and they can work independently to improve technologies and design products.

Being Realistic and Down-to-earth, Conducting Education with Characteristics According to Our Duty. During the education process in universities, first of all we have to guarantee quality. Characteristics cannot be gained from the "postgraduates' ratio" or "certificates ratio", that unrealistic and run counter to the correct direction of talents cultivation. University education is but a platform of specialized education. The pursuit of "postgraduates' ratio" and the acceptance of students evading specialized courses in order to prepare for the National Postgraduate Entrance Examinations are harmful to students, whether in their postgraduates study or in their future works. And it is also unfair to other students. Intensifying and propelling "tests of levels" for operation workers departs from the right course of undergraduate education, and their ways of education count for little. The emphasis on "one specification and multi capabilities" to raise the chance of employment decentralizes the energy of students, and results in shallow knowledge in both their majors and other branches. This way of teaching severely affects the education quality and cannot be treated as characteristic cultivation.

However, without characteristics, the application type institutes and universities will cease to develop. These institutes and universities have their local colors, and the major of mechanics designing, manufacturing and automation is a broad major, which covers a large scope. The application type institutes and universities should be connected with local economic conditions, and cultivate talents according to local industry and economic development. To cater to the demand of local enterprises and serve local economic development is the orientation of characteristic cultivation. This kind of cultivation has huge potentials. Graduation design topics can be selected according to the demand of local enterprises and individual working posts, or students can participate directly in the project of local enterprises as their Graduation design. Specialized training guarantees the quality of education, enhances the realistic working capabilities, and shortens the time of filed work. Orientated cultivation is also education with characteristics. The application type institutes and universities could be unique by combining the breadth and depth of their majors. The breadth of the mechanics major could serve as a common teaching platform, majors such as light industrial machines and plastic machines can be set according to the industrial module. Voluntary courses should be given due attention while compulsive courses should be testified by examinations. Small classes can be arranged for teaching. During the graduation design period, trainings should be intensified. Specialization on a broad basis is also an ideal education with characteristics.

5 Conclusions

The application type institutes and universities should take as their urgent duties to cultivate technological talents required by enterprises. The goal of the mechanics major should be the cultivation of mechanics engineers and technologists.

Education with characteristics can only be reached through the common efforts of all education workers. We should keep improving the quality of our teaching, focus on specialization education, build up a team with qualified teachers, and develop a benign engineering environment. We should be practical and realistic, keep drawing lessons from our practice and innovating new ideas during the process of development.

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Research and Practice to Improve the Design Capacity for Application Engineer in Mechanical Professional

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Abstract. In order to improve the design capacity for application engineers, the training mode has been presented by analyzing the capacity requirement for the mechanical engineer. As many links acting on the design ability has also been analyzed, the systematic course design has been selected as the breakthrough to cultivate innovation talents. Then the training way and specific implementation measures has been put forward. Practice in teaching indicates that significant effect coming from efficient training method and correct position in design ability training mode.

Keyword: Reform in education, Course design, Ability cultivation, Systematic practice.

Major of Mechanical Manufacturing and Automation in the department absorbed the first batch of undergraduate students in 2004. In order to build an applied major, we locate accurately and develop characteristic in major construction and teaching reform. After two years extensive investigations, deeply discussion and practical research, the cultivation mode of applied talents has formed step by step, and we also harvest in new major evaluation and degree evaluation. As all the evaluation result is excellent, Mechanical Manufacturing and Automation becomes the second important major of Ningbo. Now there are three groups of students graduated from Major of Mechanical Manufacturing and Automation with ideal degrees, which can verify that the mode of applied talents cultivation is correct and the students' design capacity has been improved greatly.

1 Mode of Capacity Cultivation on Engineers

New undergraduates and specials should all be considered as applied colleges by enrollment expansion. Every college has its own understanding of applied cultivation, and each college is different in geographical position or self-conditions, so different experience and mode can only be referred and should not be imitated. And we should recognize that we are different from study university, teaching-

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study university and special departments, so we should located accurately and develop our characteristics.

Basing on the concept of applied college serving for direct production line, by investigation in small and medium enterprises of Ningbo and its surrounding areas, and by analysis the responsibility and ability of engineers, we make it clear that the engineer in technical is response for process design, fixture design and development research of some product. So the engineer in enterprises should familiar to mechanical manufacturing, and can work with advanced manufacturing methods. Even the maintenance management engineer should familiar to machine structure and tectonic to determine accurately and debugging timely. Design engineer and technologist are needed, and the design capacity for them is the competitive element, not the operation skills. Therefore, we should carry out appropriate skill cultivation, establish higher capacity training model in process design and product design, form cultivation mode for applied engineer with innovative design capacity.

2 The Key Elements of Design Ability

Design links in mechanical professional include curriculum design of engineering graphics (Reducer surveying and mapping), curriculum design of mechanical principles, curriculum design of mechanical design, curriculum design of mechanism technology(Fixture design included), curriculum design of machine tools, the final graduation design and so on.

In the process of applied engineer cultivation, projects and arrangements of the curriculum has not change, the difference is shown in the increasing of contents and improvement in requirements. Now the curriculum design has becoming stage-design in nature, and each curriculum contents are reflected in the curriculum design. Basing on the comprehensive application of knowledge in curriculum design, the students' mechanical design ability can be improved greatly.

3 The Knowledge Structure for Design Ability Cultivation

Main Courses. Mechanical engineers are responsible for engineering drawing, structure design for new products and equipments, and process design for production and processing. So the flowing courses has been set as the core courses, such as "Engineering Graphics", "Engineering Mechanics", "Mechanical Principles", "Mechanical Design", "Mechanism technology", "Machine Tools Design" and so on. Then we pay much attention to these courses, and select the teachers who are full of experiences and are good at teaching. These measures can help to improve our teaching quality and effects.

As design cannot independent from manufacturing knowledge, the course of "mechanical manufacturing basis" has been arranged to the first term to increase acknowledges of new students. By studying this course, the students can recognize machines earlier and know basic processing method. With the increasing of

perceptual knowledges, preparations have been made for some practical links such as metalworking practice.

Engineering Practice. Engineering practice should be proper to according teaching and course design, and the arranged time is decided by specific conditions. Metalworking practice and NC practice are both important links to improve students' hands-on skill. The two links have been arranged before the course design of «Mechanical design », which is to help students have more chance for thinking and practicing. Then they can consolidate their knowledge by relating theories. In the course of practice, the most important thing is to grasp processing method and products' technology features to serve for designs. We do not advocate the two practice chances related with skill grade test. Production practice is arranged before or simultaneously with the course of "Machinery and equipment design" and" Machinery Manufacturing Technology". Then at last, all students have the chance to practice in enterprises to learn the statuses of Machinery manufacturing, and at the same time, their understanding and knowledge can be widely improved and our teaching result can be increased directly.

4 Method to Improve Students' Design Ability

Scientific Planning and Step by Step. The arrangement of course design follows the principles of stressing emphasis and dispersing difficulties. Systematic analysis, overall consideration, assignment clear, and operable are all embodied in the framework.

The course design of "Engineering Graphics"-reducer mapping is arranged after the lecture of Graphics mapping. The target is to solve questions about drawing graphics. And this link can be the basis of following course design and work. As drawings are language of engineering, to have drawing ability, express structures of parts correctly, completely and clearly is the basic requirement of engineers. In this link, we focus on improving students' drawing ability by CAD.

The course design of "mechanical design" is to master the functions and structures of equipments and to know how to choose materials and tolerances. The question about process of structures and assembly will be solved after "Machinery Manufacturing Technology".

The course design of "Machinery Manufacturing Technology" includes process design of machining and assembly process. By designing the processing and fixtures, the basis for machinery manufacturing technology will be established. After this link, students can master knowledge of machinery manufacturing process, and meanwhile, structure design and manufacturing are conformed to insure the rationality and feasibility of manufacturing.

"Machine tools" related closely with mechanical design, which is the depth and development of mechanical design. The target of "Machine tools" is to complete high quality and high accuracy. The course design of "Machine tools" is to master the design method and process of mechanical transmissions and special

equipments.\, which is basing on machine tools and can lay a solid foundation for graduating design and product design.

Course of "Mechanical theory" focuses on project design. In this link, students' analysis and synthesis capability can be improved, and the rationality and science of design can be improved too. After this course design, the students can solve the problem of matching in mechanical systems. And it is benefit to cultivate development and innovation engineers.

Practice Synthesized and Applying Knowledge to Practice. Poor capacity of application means acknowledges from courses cannot be used freely in practice. The reason is complex, but we can emphasize using in the courses, and combine engineering in the course of teaching. And the course design should be integrated design. Then the theory is related to practice, the knowledge and skill can be improved at the same time.

Course design should be the integrated design for each period. By course design, we lead the students to apply their acknowledge synthetically. Whether they can get high scores is according to their application level of the knowledge points. In course design, most students' design ability can be improved. The course design of "Mechanical design" merged the knowledge of "Mechanical design", "Basis of Mechanical Manufacturing", "Interchangeability and technical measurement". In course design of "Mechanical design", the students should not only learn how to design the structure of a part, but also learn to choose the material, to manufacture or choose the blanks, and to mark the roughness of the parts' surface. Course design of "Machinery manufacturing technology" and "Machine Tool" not only merges related contents, but also notices the relationship among course designs. In two course designs, each student should select a process to design special fixture and machine proper tool according to the process planning requirements. In this kind of course, the students engineering ability can be improved efficiently.

The period course design enhanced the combination of teaching and practice. By using this method, students' design ability and quality has been improved and meanwhile, the students learn more about their courses, which help them study actively and becomes more and more interest in the professional courses.

Be strict to Teachers and Students, and Communicated Frequently with Them. Strict training should be carried out to improve the design ability of applied talents. Firstly, the teacher's quality should be improved, so we pay more attention to establish the team of "Double-education", which require the teacher to have both solid theory level and deep engineering ability. Secondly, Teachers should be strict to students. In the course design, teachers can lead their students to consider and analyze questions independently, and improve their ability to solve different questions. And what's more, either teachers or students should pay more attention to the courses. Group guidance and individual guidance should be integrated to get an efficient result. Group guidance points out the focus and common problems. While individual guidance should consider every student's practical condition and instruct them directly. After the course design, there is also a face to face communication chance for teachers and their students, which help the students recognize their deficiencies and to improve their ability of design directly.

5 Conclusions

With the development of modern science and technology, the requirements to engineers are improving continuously. Though we have gotten certain effects, much should be done to cultivate applied talents for we still stand at the starting point of teaching innovation. From now on, we should explore new ways and absorb applied talents to improve ourselves and form our own characteristics. Then we can contribute to the cultivation of applied talents and serve for local economic development.

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