Research on the Innovation System of University Production and Education Integration Based on Computer Big Data

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Abstract. The advent of the "Internet +" era has changed the traditional model of computer education. In the field of education, with the help of the rapid development of mobile-related technologies, the mobile teaching mode combined with university curriculum teaching is growing into an increasingly popular teaching method. This article first analyzes the significance of the Internet + industry-education integration innovation education reform, the current research status at home and abroad, and introduces the specific research content and reform goals in detail. The research is based on the integration of industry and education in the "Internet +" era. The reform of the innovative education model proposes to integrate production and education into innovative education throughout the entire process of talent training. At the same time, the thesis designs and implements a multi-Agent-based innovation management information system for the integration of production and education in colleges and universities. The system has intelligent functional modules such as talent management, asset management, and system management. Each functional module of the system is introduced in detail and put forward the problems that should be paid attention to in the system implementation process.

1. Introduction

In the context of the national innovation development strategy, with various new models, new products, and new patterns continue to emerge, which has promoted the rapid development of the national economy. As the demand for innovation continues to increase, the mechanism for cultivating innovative talents is not yet perfect. This contradiction affects the current success rate of entrepreneurship. At the same time, as a base for talent training, universities lack the need for the training of entrepreneurial and entrepreneurial talents in the educational model and process, and there is still a situation where theory is more important than practice. How to cultivate innovative talents that meet the needs of the country and society? This is a problem faced by college educators. With the introduction of the "Internet +" concept, innovation and entrepreneurship in various fields have worked closely together to solve the problem of training opportunities for entrepreneurs and entrepreneurs.

The "Internet +" era brings students a high-quality networked teaching environment and abundant teaching resources, which makes up for the shortcomings of traditional education, meets the needs of modern teaching, and brings a different teaching model to computer education. Innovating modern computer education plays a major role in cultivating outstanding talents [1]. Mobile teaching is a new type of teaching activity with the help of mobile communication technology and Internet technology,

using various mobile intelligent terminal devices as the carrier. It is developed based on the combination of distance education and digital education. It has the characteristics of mobility, autonomy, and interactivity in time and space, and makes full use of the scattered time periods outside of class for learning. Learning is possible. Compared with the traditional teaching mode, the mobile teaching mode is more prominent in mobility and autonomy. Therefore, we take the computer application-oriented talent training under the background of "Internet +" as the guide, take the innovation and entrepreneurship training model reform as the starting point, integrate production and education integration, and school-enterprise cooperation as the application of technical talents to cultivate students' sense of innovation , Entrepreneurial ability as the goal, actively explore measures such as technological innovation and competition construction, curriculum reform, school business platform integration, etc., to cultivate outstanding dual-creation computer application talents.

2. Research content and application prospects

2.1. Research content

The main goal of the construction of the school-enterprise collaborative education platform of "industry-education integration, school-enterprise cooperation" is to improve the quality of talent training, form the concept of industry-university-research collaborative education, advocate a collaborative education culture, and form school-enterprise cooperation to promote school industry-research New ideas for fusion construction. At the same time, with the goal of improving the quality of talent training, focusing on reforming the talent training mechanism, building a collaborative education system, building a platform for collaborative education of industry, university and research, creating a path for collaborative education, advocating a collaborative education culture, and forming a school-enterprise linkage, A new model of three-dimensional advancement. Specifically, there are the following points:

2.1.1. Explore a new and meaningful new model of industry-research integration school-enterprise cooperative education. Focusing on "in-depth cooperation and integration of production and education", breaking through the limitations of traditional educational practice modes, reaching students, professors, lecturers, engineers, business managers and other personnel at different levels to communicate in the same environment, breaking through traditional teaching methods The transfer of knowledge can more effectively complement the knowledge in teaching, and can better share and advance resources in school-enterprise cooperation, and create a more brand-new teaching model [2]. At the same time, vigorously promote the construction of the "double-qualified" teacher team and the practice of innovation and entrepreneurship by students.

2.1.2. To build a "three-in-one" innovative interactive school-enterprise collaborative education platform. Maximize the inherent potential of integrating school professional development, corporate talent needs and student learning interests. That is to integrate the advantages of computer resources and software and hardware to meet the needs of market enterprises; enterprises hope to expand the market and improve the demand for talents for product advantages; to give play to teachers' interest in teaching and students' interest in learning. Establish a "three-in-one" platform mechanism to build innovative platforms such as market demand, talent specifications, knowledge and skill structure, curriculum settings, teaching content and professional direction adjustment, and performance assessment.

2.1.3. Make full use of resources to promote the sustainable development of "school-enterprise cooperation". Strengthen the cooperation between universities and enterprises in order to win more professional competition and better enhance social reputation. We will make full use of the college's hardware and software resources and ensure the sustainable development of effective resources through a standardized management system. In order to improve the quality of talent training in higher vocational colleges, it is necessary to make talent training as a target oriented to the market, school-running forms to adapt to the market, and professional construction oriented to the market. It is necessary to deepen

school-enterprise cooperation in education, strive to win the support of enterprises, and actively serve the needs of enterprises. This is the basic way to cultivate high-quality technical personnel and realize the healthy and rapid development of vocational education. Driven by the needs of enterprises, we adopt an open school model, unswervingly follow the road of integration of production, education and research, and cooperate with enterprises to achieve complementary advantages and benefit sharing, and further enhance the motivation and vitality of school development.

2.2. Application prospects

The computer application technology major follows the school's professional orientation of focusing on engineering and coordinated development of engineering, economics, management, and liberal arts. It is based on serving the local economy and guided by the scientific development concept to promote professional reforms and strengthen connotation Build and improve the level of running schools, and constantly explore the talent training model of "school-enterprise cooperation, industry-university-research integration"; create a "double-qualified" professional teaching team with high-quality, reasonable structure, and combination of professional and professional teaching; deepen practical teaching reform and improve Teaching management, continuously improve the level and quality of running schools of this major; actively carry out social services, give full play to the demonstration and leading role of characteristic majors, and build this major into the characteristics of "marketing needs, school-enterprise cooperation" characteristics, and reaching students' graduation At the level of employment, it can train a large number of "applied and engineering" high-tech talents for the economic construction of the Pearl River Delta, and truly realize the seamless connection between schools and enterprises.

Through the "integration of production and education, school-enterprise cooperation" talent training model as the main line of the construction of this project, the information industry demand as the guidance, quality improvement as the core, reform and innovation as the driving force, and the reform of the talent training model as the focus, deepen teaching Reform, research and solve the teaching practice problems of improving the quality of talent training, cultivate teaching results, and comprehensively improve the overall school running level of the college; strive to build a new school-enterprise cooperation and collaborative innovation within two years A set of curriculum system for cultivating applied innovative talents, building a team of teachers with a high level of teaching and scientific research, a "dual-teacher structure" with strong practical and innovative abilities, and a provincial level with certain influence and status among similar institutions Special profession.

3. Holographic management mode of technological innovation in universities

The holographic three-dimensional model of the scientific and technological innovation system of universities is shown in Figure 1. In Figure 1, there are three coordinates: talent, assets, and management. These three factors are constantly changing and interrelated. The contents they contain are:
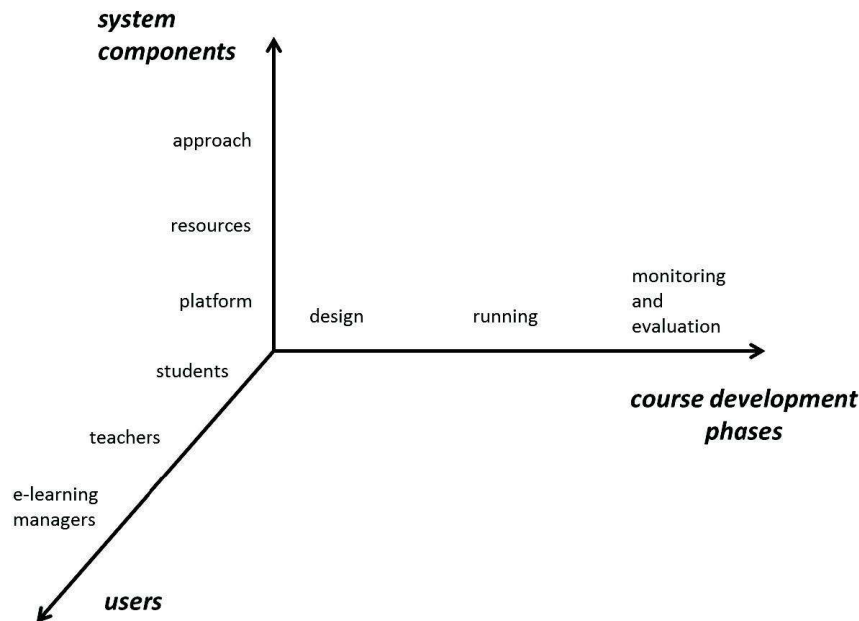
Figure 1. The three-dimensional model of the scientific and technological innovation system of universities

Talents mainly refer to people with scientific research capabilities. These talents not only have independent scientific research capabilities, but also have the sincerity to cooperate with others, have team spirit, and can carry out scientific research activities together with other talents. In addition, these talents should also have the opportunity to exchange and learn with scholars and experts outside the school, and be able to obtain advanced knowledge from the outside world and share with school members to learn together. The knowledge possessed by talents is mainly tacit knowledge. The more talents there are, the more hidden tacit knowledge, the stronger the foundation of scientific research and innovation, and the greater the potential.

Assets include scientific research funds, scientific research equipment, scientific research sites, scientific research materials and other material conditions for scientific research. The assets presented are mainly explicit knowledge. The richer the assets, the easier the accumulation of explicit knowledge and the easier the exchange of knowledge.

Management includes management system and manager's ability. If managers are very supportive of scientific research, take scientific research as the top priority of universities, and formulate a sound scientific research incentive mechanism, scientific research funding guarantee mechanism, reasonable organizational structure and operating mechanism, and be able to cooperate with other universities, enterprises, and institutions, it will greatly promote scientific research and innovation [3]. Reasonable management is a necessary means to transform tacit knowledge into explicit knowledge. A good management mechanism can stimulate the potential of talents (researchers), and it is easy to transform the tacit knowledge hidden in the researchers into explicit knowledge, that is, to produce scientific research results. Conversely, the accumulation of scientific research results transforms these explicit knowledges into tacit knowledge, enabling research institutions to form a unique research organization culture, enhancing the sense of belonging and cohesion of researchers, and further stimulating the innovation potential and motivation of researchers, Forming a virtuous circle.

4. New ideas for the innovative education model of computer production and education integration

Through school-enterprise cooperation, actively strengthen the intensity and depth of school-enterprise cooperation based on the "eight commons", establish a dual innovation practice education system, build

a dual innovation education platform, and improve the quality standards for dual innovation training. Move the company's leading technology and knowledge resources forward to the school's professional teaching system, conduct joint education and train industry talents in different depths from curriculum development, professional co-construction, college co-operation, etc.; at the same time, conduct teacher training and applied scientific research cooperation. The deep integration of enterprise resources has enabled the school to become an enterprise's application development partner in a certain industry's informatization application field on the basis of satisfying the training of talents [4]. The school and enterprise promote each other in their respective business development and develop together to form an "in-school" Implementation, enterprise-led, teacher-student participation, market application "new model of industry-university-research cooperation From "research status and enterprise investigation and analysis" to "formulation of talent training plan", further "construct innovation and entrepreneurship quality education", and based on school-enterprise cooperation, promote the integration of production and education innovation education in accordance with the "eight commons". Push the entire talent training process, and then integrate feedback into the talent training system to form a semi-closed loop system, as shown in Figure 2.
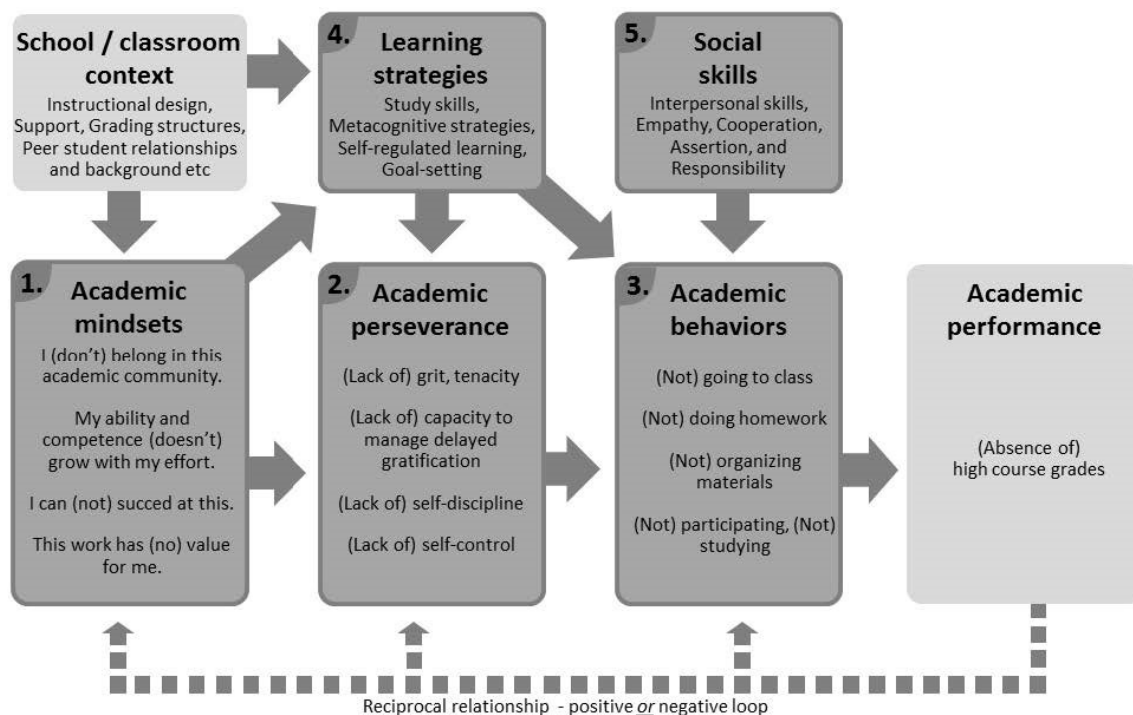

Figure 2. The model diagram of the innovative education model for the integration of computer production and education

of all, according to the school's proposal to promote the joint construction of school-enterprise cooperation majors under the guidance of the "eight commons", through the construction of bases, the computer professional group is the object, and in accordance with the principles of "co-construction, sharing and co-management", building a "And the "Enterprise-in-school" model, forming a "dual main body" construction mechanism, building an application ability training as the center, formulating industry talent training standards, realizing technical tracking of university teachers, deepening the training of students' engineering application practice ability, and formulating a set of adaptations The talent training program required by the industry provides a reference for the integration of production and research to improve teaching quality and achieve training goals.

Secondly, in accordance with the method of "co-construction, co-management, and collaborative education", the thesis takes enterprise leading technological resources and customized services as the

back-end resource development pool, and creates an all-round and three-dimensional trinity of "Hezhou College, Enterprise Innovation Base, and Professional Steering Committee" The talent training quality monitoring, evaluation and feedback system solves the current problems of incomplete monitoring and evaluation of talent training quality, lack of social supervision, and inability to provide timely feedback [5]. It has obvious innovation and use value in reforming the teaching quality evaluation model.

Third, the thesis proposes a teaching construction plan and experimental guidance plan that integrates professional competence and professional competence certification mechanism to determine the setting of the training base, functional division, equipment configuration, layout arrangement, training projects, management and operation, etc., and perfect The design of the internship training teaching system has been formed, and the internship training and teacher training system of "market-oriented, industry-led, timely interaction" has been formed, and the establishment of scientific training bases, complete equipment configuration, comprehensive training projects, and professional courses have been realized Novelization, authenticity of case teaching, rationalization of layout and standardization of management and operation, have good promotion and use value in strengthening the basic construction and effects of teaching.

Fourth, the paper proposes an organic combination of theory and practice, establishing a multi-level and diversified practical teaching system that complements the theoretical teaching system, so that theory and practice, knowledge transfer and ability training run through the entire teaching process. Based on school-enterprise cooperation, through the implementation of the "embedded" "1+2+1" talent training model, the needs of both schools and enterprises are embedded in the process of talent training, and the connotation construction highlights the mutual embedding of the needs and resources of both schools and enterprises, Effective integration of theoretical teaching and practical teaching embedded in each other.

5. University production and education integration system

5.1. Function module

Based on the above-analyzed three-dimensional system of innovation management for the integration of industry and education, a university industry and education integration innovation management information system can be designed. The system should include the following functional modules: talent management module. Talent management includes two functional modules, one is the management module for the identification, training, and development of internal talents, and the other is the management module for searching, identifying, and introducing external talents. Asset management module. Contains two modules, one is the management module of scientific research funds and scientific research equipment within the school, which belongs to general affairs management; the other is the search and utilization management module of scientific research resources available outside the school. System management module. Contains salary management module and scientific research management module [6]. The scientific research management module includes the project application and approval module, the scientific research achievement submission module, the scientific research achievement evaluation module, the new technology search module, and the internal core technology determination module. In these sub-modules, salary management, project approval, and scientific research results submission management all belong to the management of general daily affairs, while scientific research results evaluation, new technology search, and internal core technology determination modules all require certain analysis to get results. Figure 3 shows the functional module diagram of the university production-education integration system.
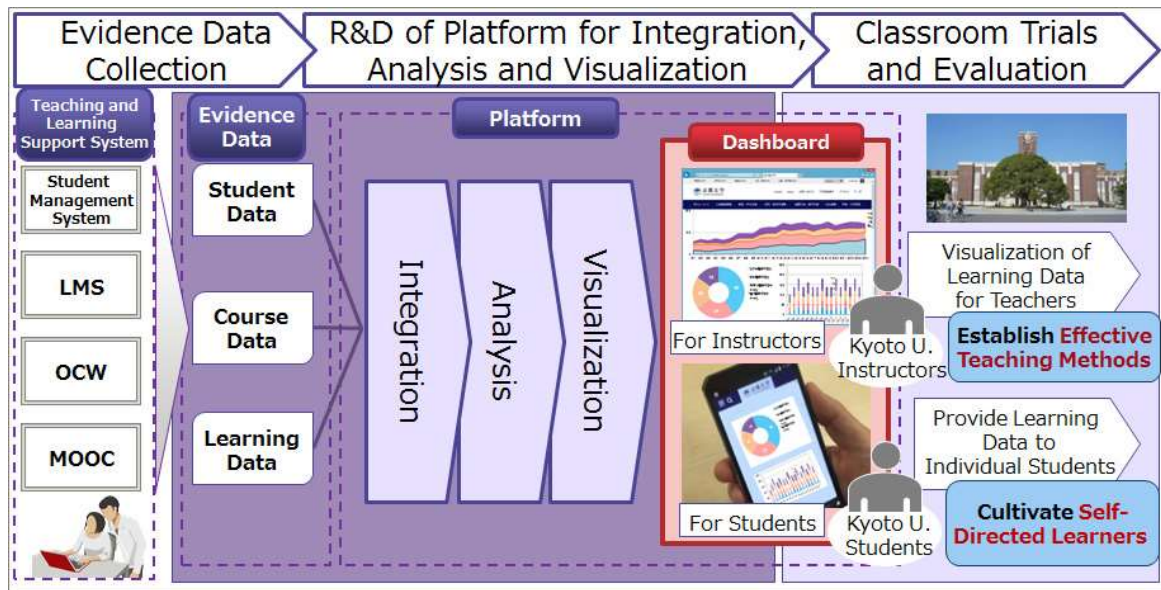
Figure 3. The functional module diagram of the university production and education integration system

5.2. Technical architecture

Agent technology is a technology widely used in the network environment. Each independent agent has the characteristics of autonomy, interactivity, proactiveness, and intelligence. Multi-Agent technology is used in the innovation management information system for the integration of industry and education in colleges and universities [7]. The system structure of the multi-agent-based innovation management information system for the integration of production and education in colleges and universities is shown in Figure 4.
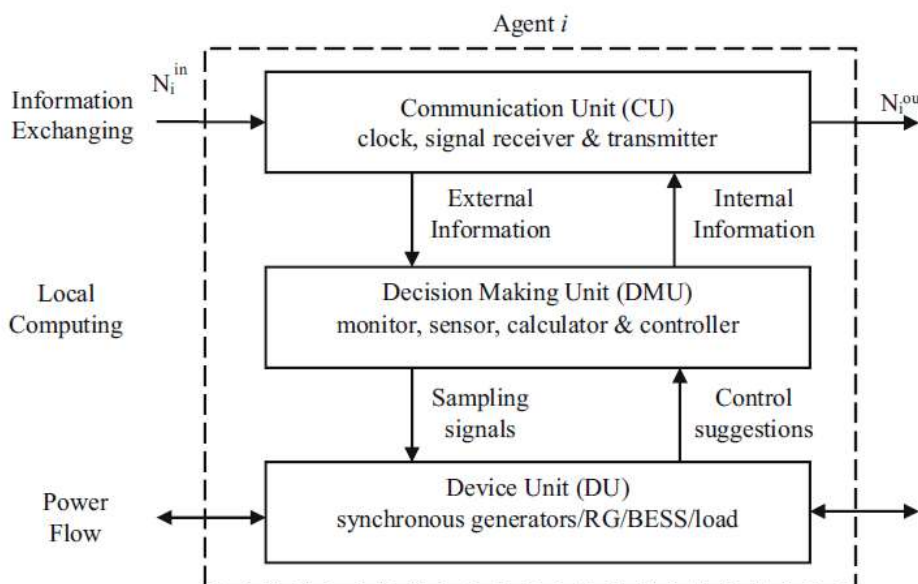

Figure 4. University Innovation Management Information System Based on Multi-Agent

functions of each Agent management module in the system are as follows: The functions of the internal talent management agent are: 1. Record the details of internal talents, including the expertise,

interests, and personality characteristics of internal talents, and establish an internal talent database. 2. Combining the direction of scientific and technological innovation in universities, analyze the future career development of each talent, make their career plan, and provide guidance for the development of each talent. 3. According to the career plan, formulate the research direction and knowledge and skill training plan for each talent. 4. According to the university's scientific research innovation strategy, analyze the direction and quantity of talents that are in short supply in universities.

The functions of searching for external talents and introducing Agent are: 1. Collecting information on external talents, using search engines to search from the Internet, TV and other media, or from the external network of internal talents. 2. Establish an external talent database to store external talent information. 3. According to the professional direction and number of talents that are in short supply in universities analyzed by the internal talent management Agent, search for suitable talents from the external talent information database. 4. According to the specific requirements of talents, combined with the management of assets, formulate an appropriate introduction plan. 5. After introducing talents, transfer the external talent information to the internal talent database.

The functions of the internal scientific research resource management agent are: 1. Record the available funds and equipment for scientific research on campus, and establish a database of available scientific research resources. 2. Analyze whether the scientific research resources required for scientific research innovation are sufficient. 3. According to the university's scientific research innovation strategy, formulate a demand plan for scientific research resources. 4. Provide and rationally arrange the resources needed for scientific and technological innovation in colleges and universities in light of the externally available scientific research resources.

The functions of the external scientific research resource management agent are: 1. Collect data of external scientific research resources and store information of external scientific research resources. 2. Analyze the availability of external scientific research resources, that is, analyze the availability and compensation of external resources. 3. According to the scientific and technological innovation plan, formulate methods and plans for using external scientific research resources.

The functions of the internal core technology management agent are: 1. Collect the scientific research results of universities over the years and establish a scientific research results database. 2. Analyze the core technology of colleges and universities in combination with the internal talent database. Science and technology with great research value, wide range of applications, development prospects, among the best in this major, and rarely studied by other schools is the internal core technology. 3. Determine the research plan and development plan of the internal core technology. 4. Determine part of the confidentiality management method of internal core technology.

The functions of the new science and technology management agent are: 1. Use a search engine to search for new science and technology from the relevant book database and news information database to establish a new science and technology database. 2. From the new science and technology database, combined with the university's talent situation and scientific research resources, analyze which is suitable for the university's research, and formulate new science and technology research strategies.

The functions of the Scientific Research General Affairs Management Agent are: 1. Subject application processing. 2. Subject approval processing. 3. Evaluation of scientific research results. 4. Combining internal and external talent information, scientific research resource information, and technical information to formulate scientific research innovation strategies for universities. Figure 5 shows the general structure of the integrated framework. In such an architecture, the editing and browsing methods of 3D software can be unified into the integrated framework. The interface for editing and browsing is implemented in each 3D integrated component, which is called by the component dispatcher after registration.
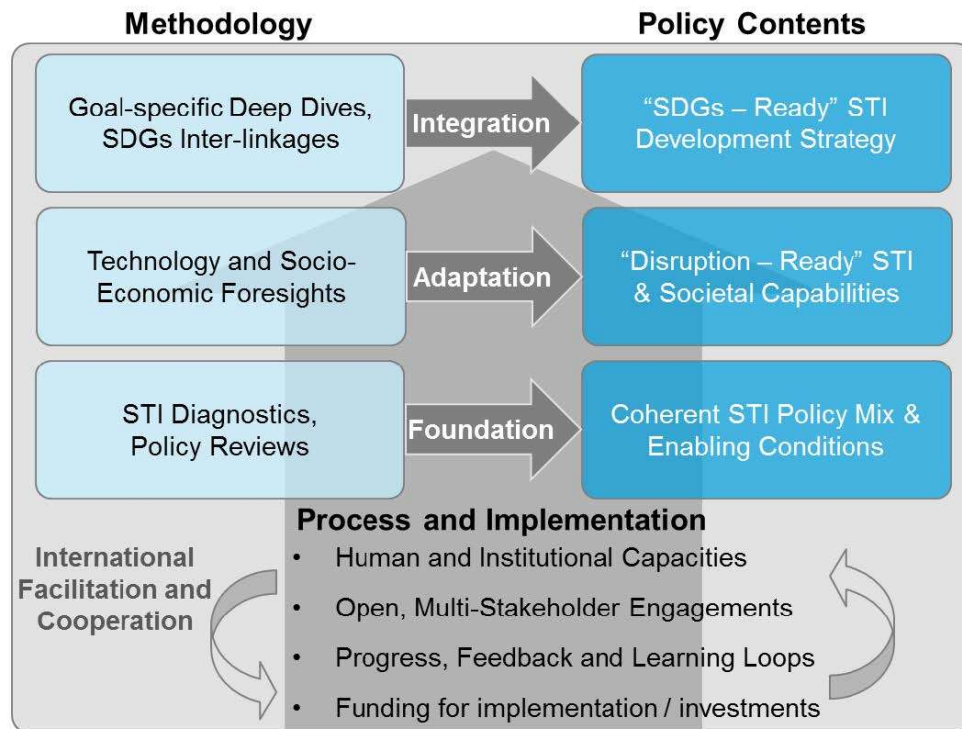
Figure 5. Integrated framework structure

6. Application of computer big data algorithm in the integration system of production and education

6.1. Overview

Teaching is a core part of higher education. The quality of teaching will directly affect the development of talents and the realization of educational goals. Among the many factors that affect teaching quality, the teaching quality of teachers is one of the most important indicators. Establishing scientific and effective teaching quality evaluation methods can enable teaching to obtain more comprehensive feedback information, so that teachers can improve teaching methods in time and ensure teaching quality. Due to the vagueness and dynamics of teaching quality evaluation, it is difficult to directly analyze it quantitatively. Early teaching quality evaluation methods are mostly qualitative, and they are realized through subjective scoring by supervision, peers, and students.

6.2. Average comprehensive evaluation algorithm

This algorithm is currently the method used in our school's teaching evaluation system. Its core idea is to assume that all indicators have the same role in the comprehensive evaluation process. Therefore, first calculate the comprehensive score of each indicator separately, and then calculate their average value. Final Results. The specific process is as follows: Input: The result of students' evaluation of teachers according to various indicators in the university's teaching quality evaluation index system. Output: The average comprehensive evaluation score of college teaching quality. Figure 6 shows the process of the average comprehensive evaluation algorithm.
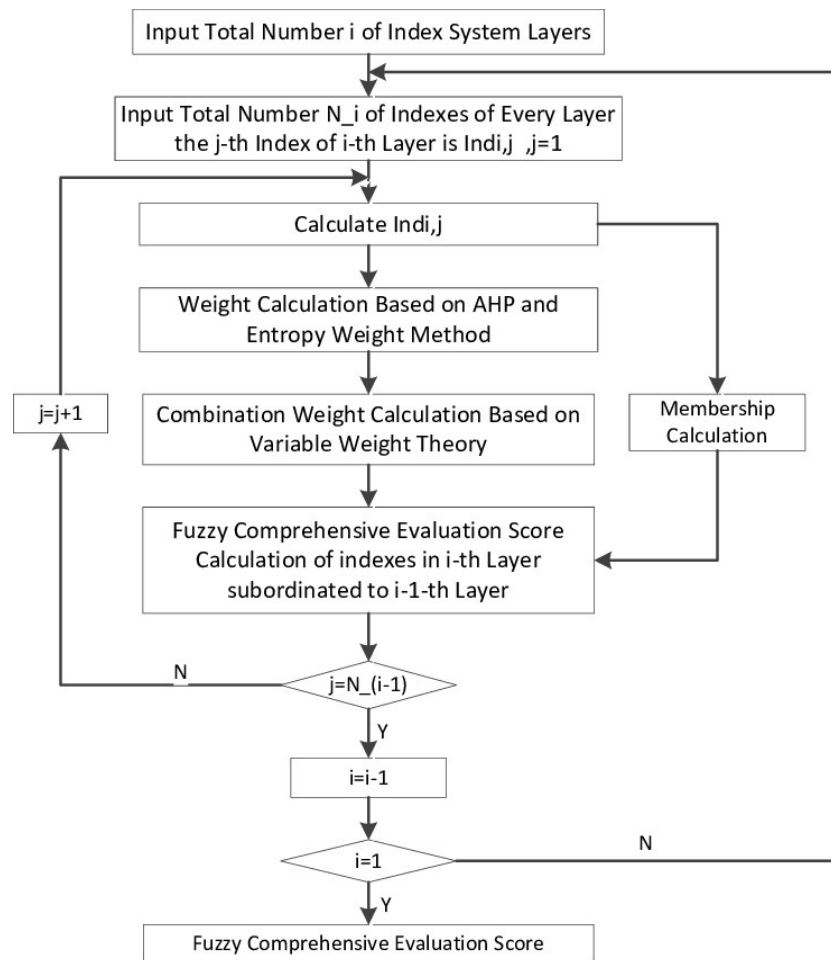
Figure 6. Algorithm flow of average comprehensive evaluation

Step1: Determine the evaluation factor set U, which can be a multi-layer structure. The factor set $U = \{u_1, u_2, ..., u_m\}$ is a collection of multiple factors that characterize the object being evaluated.

Step2: Determine the comment set V of the evaluation factors. Comment set $V = \{v_1, v_2, ..., v_n\}$ is a collection of comments on the state of each factor.

Step3: Establish a comprehensive evaluation vector set Q. $Q_i = \{q_{i1}, q_{i2}, ..., q_{in}\}$ is the single factor evaluation of the i-th factor u_i on the comment set V, and q_{ij} indicates that the i-th factor has the membership degree of the j-th comment v_j. Generally, satisfy $\Sigma_{j=1}^{n} q_{ij} = 1$ after normalization.

Step4: Calculate the comprehensive evaluation score. Suppose the assignment matrix is $C = \{c_1, c_2, ..., c_n\}$, then the comprehensive score of each indicator is:

$$X_i = Q_i \cdot C = \{q_{i1}, q_{i2}, ..., q_{in}\} \begin{Bmatrix} c_1 \\ c_2 \\ ... \\ c_n \end{Bmatrix} \tag{1}$$

Because all indicators have the same weight, the final comprehensive evaluation score is the average of the comprehensive scores of each indicator, namely:

$$X = \bar{X} = 1/n\Sigma_{i=1}^{n}X_i \qquad\qquad (2)$$

6.3. Fuzzy comprehensive evaluation algorithm

Fuzzy theory is developed on the mathematical basis of fuzzy set theory founded by Professor Zadeh of the University of California in 1965. The ambiguity in this method refers to the uncertainty of division that appears when there is an intermediate transition between the differences of objective things. In the evaluation of teaching quality, students are asked to evaluate teachers based on evaluation indicators and select "excellent", "good", "moderate", "qualified" and "unqualified", which is prone to ambiguity. Fuzzy mathematics is the use of precise mathematical methods to describe and model a large number of fuzzy concepts and fuzzy phenomena in the real world in order to achieve the purpose of proper processing. It is the theoretical basis of fuzzy comprehensive evaluation algorithms. The process of fuzzy comprehensive evaluation algorithm is as follows: Input: The result of students' evaluation of teachers according to the various indicators in the university's teaching quality evaluation index system. Output: Fuzzy comprehensive evaluation score of university teaching quality. Figure 7 shows the fuzzy comprehensive evaluation algorithm flow.
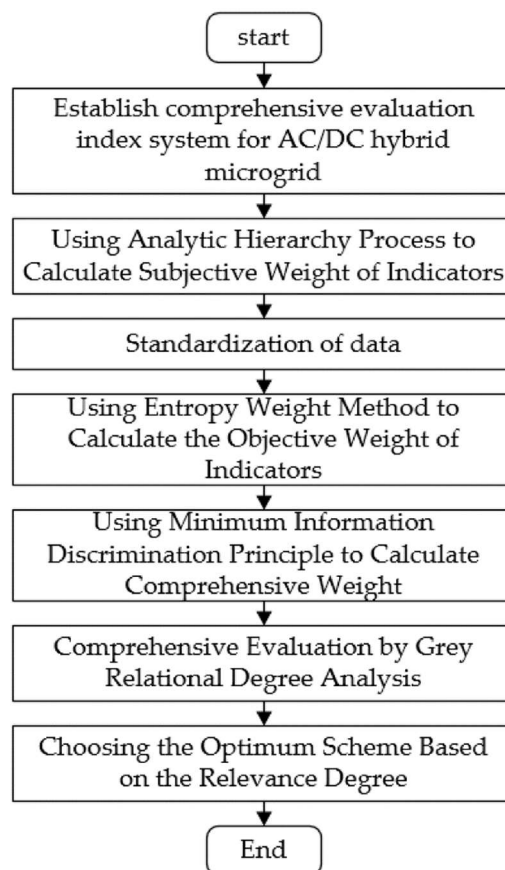

Figure 7. Algorithm flow of fuzzy comprehensive evaluation

Step1: Determine the evaluation factor set U, which is the same as the average comprehensive evaluation algorithm Step1.

Step2: Determine the comment set V of the evaluation factors, which is the same as the average comprehensive evaluation algorithm Step2.

Step3: Determine the weight of each evaluation factor. Use a certain method to solve the weight vector $W = \{w_1, w_2, ..., w_n\}$ of the evaluation factor, which can be calculated using the mean method, AHP

method, and rank sum operation. The size of the factor weight represents its importance in the comprehensive evaluation, and $\Sigma_{i=1}^{n} w_i = 1$.

Step4: Establish a comprehensive evaluation matrix $R = \left(r_{ij} \right)_{m \times n}$. $R_i = \left(r_{i1}, r_{i2}, ..., r_{in} \right)$ in the evaluation matrix $R = \left(r_{ij} \right)_{m \times n}$ is the single-factor evaluation of the i-th factor u_i on the comment set V, and r_{ij} means that the i-th factor u_i has the degree of membership of the j-th comment.

Step5: Fuzzy comprehensive evaluation. According to the weight vector W and the comprehensive evaluation matrix $R = \left(r_{ij} \right)_{m \times n}$, calculate the fuzzy comprehensive evaluation set B of the evaluation object v_j:

$$B = W \bullet R = \left\{ w_1, w_2, ..., w_n \right\} \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix} \tag{3}$$

Step6: Calculate the comprehensive evaluation score of the evaluated object. In order to express the evaluation result with an intuitive score, you can assign a value to the evaluation level (score from 0 to 100), and set the assignment matrix to $C = \left\{ c_1, c_2, ..., c_n \right\}$, then the final evaluation result expressed in the form of score is:

$$X = B \bullet C = \left\{ b_1, b_2, ..., b_n \right\} \begin{bmatrix} c_1 \\ c_2 \\ \cdots \\ c_n \end{bmatrix} \tag{4}$$

6.4. Implementation of fuzzy comprehensive evaluation algorithm

6.4.1. Determine the set of evaluation factors. Here, the evaluation index system in the previous article is used as the set of evaluation factors, as shown in Table 1.

Table 1. Evaluation index system of teaching quality in universities

Target layer	Criterion layer	Index layer
Teaching quality I	Teaching content I1	I11 The concept is accurate, the key points are prominent, the difficulty is appropriate, the examples are appropriate
		I12 Integrate theory with practice, absorb the latest research results, and reflect the frontiers of the discipline
	Teaching attitude I2	I21 Full lesson preparation, serious homework correction, patient guidance and answering questions, strict requirements for students
		I22 Be rigorous in academic studies, be an exemplary teacher, go to and from get out of class on time, and not arbitrarily mediate classes
	Teaching skills I3	I31 Focus on classroom discussion and presentation, and be able to use modern educational technology scientifically as needed
		I32 Use Putonghua to teach, accurate, fluent, neat and standardized writing on the blackboard
	Teaching effect I4	I41 The teaching content is easy to accept and master. Through learning, the ability can be improved
		I42 lectures are welcomed, the classroom atmosphere is active, interactive, and the style of study is excellent
	Teaching Method I5	I51 The methods are flexible and diverse, vivid and effective, and guide students to think and innovate
		I52 Teach proficient, inspiring, artistic, and focus on ability training

Teaching quality evaluation is a process of value judgment based on certain goals. Teaching quality is a comprehensive concept involving teaching content, teaching attitudes, teaching skills, etc. The evaluation of teaching quality requires decomposing the evaluation content according to the evaluation goals. To find the main factors that reflect the specific and behavioral characteristics of an aspect of the evaluation object, and then evaluate. Therefore, in accordance with the idea of "simplifying the complex", this article conducts research through various methods such as organizing expert discussions, questionnaire surveys of teachers and students, interviews, etc., and finally constructs "teaching quality" into a three-tiered evaluation index system. Then, the evaluation status of each evaluation index is calculated first, and then integrated into the evaluation of the overall teaching quality through a certain algorithm, so as to achieve the evaluation of the overall teaching quality through the analysis and evaluation of the evaluation index system.

6.4.2. Establish evaluation index comment set. This article's comment set = ("excellent", "good", "medium", "qualified", "unqualified"), and its corresponding comment score set = (95, 85, 75, 60, 55).

6.4.3. Apply AHP method to determine the index weight. Here, 20 representative experts in the frontline of teaching and teaching management positions were invited to fill in the Questionnaire on the Importance of Teaching Quality Evaluation Indexes in Colleges and Universities, and 10 high-quality questionnaires were selected as the survey results. After the questionnaires were collected, the consistency of the comparison results of the index importance of each questionnaire was first tested. Among them, 8 questionnaires passed the test as valid questionnaires, and 2 failed the test. Experts are asked to adjust the content of the questionnaire (using Python to develop the adjustment Procedures, experts can refer to and use) until passed. Then, according to the results of the questionnaire, the AHP method is used to calculate the weight of each evaluation index. Table 2 shows the weight of each evaluation index calculated based on the results of a questionnaire.

Table 2. Teaching quality evaluation index weight

Target layer	Criterion layer	Index layer	Comprehensive weight
Teaching quality I	Teaching content I1 (0.1405)	I11(0.3333)	0.0468
		I12(0.6667)	0.0937
	Teaching attitude I2 (0.1065)	I21(0.500)	0.0533
		I22(0.500)	0.0533
	Teaching skills I3 (0.1854)	I31(0.6667)	0.1236
		I32(0.3333)	0.0618
	Teaching effect I4 (0.3229)	I41(0.3333)	0.176
		I42(0.6667)	0.2153
	Teaching Method I5 (0.2447)	I51(0.6667)	0.163
		I52(0.3333)	0.0816

Using the same method, based on the questionnaire survey data of other experts, the respective index weight results can be calculated. In order to ensure correctness and operation efficiency, this article uses Python programming to achieve, and the efficiency has been very well improved. After calculating the weights of the evaluation indicators of 10 experts, and then calculating the arithmetic mean value, the final weight value of each indicator can be obtained. The summary data is shown in Table 3.

Table 3. Weights of teaching quality evaluation indicators

Index code	Expert questionnaire code										Arithmetic mean
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
I11	0.0097	0.0468	0.0484	0.0095	0.1625	0.1691	0.0142	0.1522	0.0612	0.0306	0.0704
I12	0.0871	0.0937	0.0484	0.0568	0.0813	0.1691	0.1136	0.1522	0.1835	0.0306	0.1016
I21	0.0774	0.0533	0.0774	0.0266	0.1499	0.2335	0.2123	0.2663	0.0927	0.5114	0.1701
I22	0.0086	0.0533	0.0086	0.0266	0.0749	0.0584	0.2123	0.038	0.0927	0.0731	0.0646
I31	0.1842	0.1236	0.1727	0.1709	0.0841	0.0961	0.0043	0.0381	0.0533	0.0278	0.0955
I32	0.023	0.0618	0.0345	0.1709	0.0093	0.016	0.0301	0.0054	0.0533	0.0278	0.0432
I41	0.0493	0.1076	0.2219	0.2395	0.0872	0.0221	0.1894	0.038	0.1615	0.1231	0.1239
I42	0.3944	0.2153	0.2219	0.2395	0.0291	0.1325	0.1894	0.2663	0.1615	0.1231	0.1973
I51	0.0208	0.1631	0.0832	0.0299	0.1609	0.0517	0.0172	0.0218	0.0703	0.0264	0.0645
I52	0.1455	0.0816	0.0832	0.0299	0.1609	0.0517	0.0172	0.0218	0.0703	0.0264	0.0688

7. Conclusion

Through the research and practice of the innovative talent training model for the integration of production and education, the combination of theory and practice teaching is promoted, the teaching process is optimized, and the quality and efficiency of teaching are improved. School education and teaching, create school characteristics, improve the level of education, and make contributions to meet the needs of local college education reform and development. Through research, the effective promotion of computer science teaching has promotion and application value for the cultivation of innovative talents in the integration of production and education in local universities.

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