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ACADEMIC PERFORMANCE OF COLLEGE STUDENTS IN FINANCIAL  
MANAGEMENT AND RELATED PREREQUISITE COURSES: A COMPARISON  
OF SENIOR HIGH SCHOOL AND COMMERCIAL HIGH SCHOOL GRADUATES  
ATTENDING TAMSUI OXFORD UNIVERSITY COLLEGE IN TAIWAN

A dissertation submitted in partial fulfillment

of the requirements for the degree of

DOCTOR OF EDUCATION

in

CURRICULUM AND INSTRUCTION

by

Biing-Shyun Lin

1999

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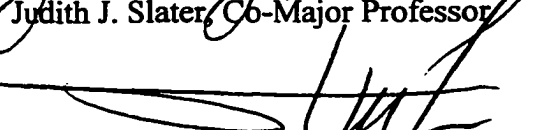
To: Dean Robert Vos  
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This dissertation, written by Biing-Shyun Lin, and entitled, *Academic Performance of College Students in Financial Management and Related Prerequisite Courses: A Comparison of Senior High School and Commercial High School Graduates Attending Tamsui Oxford University College in Taiwan*, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

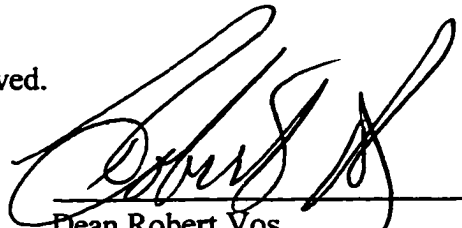
  
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The dissertation of Biing-Shyun Lin is approved.

  
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## DEDICATION

This research paper is dedicated to my immediate family: Rang-Chuan Lin, my father; Chang-Er Chang, my mother; Cindy Hui Tang, my wife; Joyce Shin Lin, and Dawn Tung Lin, my daughters. Without their understanding, patience, sacrifice, support and love, the completion of this work would not have been possible. Thank you for everything that you have done for me.

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Finally I wish to express my sincere appreciation to my family for their continued support, encouragement, and unconditional love during this study. They made pursuit of my doctorate degree both possible and meaningful.

# ABSTRACT OF THE DISSERTATION

ACADEMIC PERFORMANCE OF COLLEGE STUDENTS IN FINANCIAL  
MANAGEMENT AND RELATED PREREQUISITE COURSES: A COMPARISON  
OF SENIOR HIGH SCHOOL AND COMMERCIAL HIGH SCHOOL GRADUATES  
ATTENDING TAMSUI OXFORD UNIVERSITY COLLEGE IN TAIWAN

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In Taiwan, the college freshmen are recruited graduates of both senior high school and senior vocational school. The Ministry of Education (MOE) of the Republic of China prescribes the standards of curriculum and equipment for schools at all levels and categories. There exists a considerably different curriculum arrangement for senior high schools and vocational high schools in Taiwan at the present time. The present study used a causal-comparative research design to identify the influences of different post-secondary educational background on specialized course performance of college business majors.

The students involved in this study were limited to the students of four business-related departments at Tamsui Oxford University College in Taiwan. Students were

assigned to comparison groups based on their post-secondary educational background as senior high school graduates and commercial high school graduates. The analysis of this study included a comparison of students' performance on lower level courses and a comparison of students' performance in financial management. The analysis also considered the relationship between the students' performance in financial management and its related prerequisite courses. The Kolb Learning Style Inventory (LSI) survey was administered to categorize subjects' learning styles and to compare the learning styles between the two groups in this study. The applied statistical methods included t-test, correlation, multiple regression, and Chi-square.

The findings of this study indicated that there were significant differences between the commercial high school graduates and the senior high school graduates on academic performances in specialized courses but not in general courses. There were no significant differences in learning styles between the two groups. These findings lead to the conclusion that business majors' academic performance in specialized courses were influenced by their post-secondary educational background.

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## CHAPTER ONE

### INTRODUCTION

The present school system in Taiwan begins with a kindergarten education and then compulsory education consisting of a six-year primary education and a three-year junior high school education. After completing compulsory education, a student may choose further study in either senior high school or senior vocational high school (Yung & Welch, 1991). To gain admission to a senior high school, a junior high graduate should first pass either the entrance examination required by the school or the qualification test, then go through a process of registration and school assignment. The length of both patterns of post-secondary high school is three years (MOE of ROC, 1997a).

Senior high schools in Taiwan have the responsibility of developing the student's competitive, academic, and social instincts, teaching the students to think analytically, and to develop the resources of personality and citizenship (Chyu & Smith, 1991). In the school year 1996, the number of students in senior high school were 268,066 (MOE of ROC, 1997b). The aim of senior vocational high schools is to instruct youth with vocational knowledge and ability, to educate for vocational morality, and to cultivate good all-around technicians at the basic level (Yung & Welch, 1991). Senior vocational high schools are categorized into seven specializations, they are: agriculture, commerce, home economics, industry, marine products, nursing and medical technology, as well as

opera and the arts. In the school year 1996, there were 520,153 students enrolled in senior vocational high school in Taiwan. Among these students, 199,639 majored in commerce (MOE of ROC, 1997a; MOE of ROC, 1997b; Lee & Hwang, 1996).

In Taiwan, college freshmen are the recruited graduates of both senior high school and senior vocational school (MOE of ROC, 1997a). According to the law of the Republic of China (ROC), the Ministry of Education (MOE) prescribes the standards for curriculum and equipment for schools at all stages and categories (Boyd & Lee, 1994). The curriculum standards for schools at different stages and categories are set primarily according to the aim and policy of education of the country. There exists a considerably different curriculum for senior high schools and senior vocational schools in Taiwan at the present time (MOE of ROC, 1997a).

The senior high schools in the system of education of Taiwan are designed as the preparatory schools for college or university; the academic subjects taught in senior high schools are general academic subject matter courses, not specialized ones. The subjects in the senior vocational schools are characterized by specialized courses intended to cultivate of professional manpower (Lee & Hwang, 1996; Epstein & Kuo, 1991). Thus, at the beginning of their first collegial year, the senior vocational school graduates might have more specialized knowledge in specialized fields than the senior high school graduates. On the other hand, the students who graduated from the senior high schools might have more preparation for the post-secondary level in academic subject matter than the students who graduated from the senior vocational schools (Wu, 1997). According to Sapre (1984), vocational schools emphasized the practical, while college business schools

were more conceptual and analytical in orientation. While Sapre's study implied that the learning strategy in college is dramatically different from the learning strategy in high school, Paulsen and Gentry (1995) found that learning strategy was significantly related to academic performance in their study. Therefore, even though the senior commercial high school graduates might have more knowledge in specialized fields than the senior high school graduates at the beginning of their first collegial year, the senior commercial high school graduates' academic performance in specialized fields are not necessarily better than that of the senior high school graduates in college business school.

Tamsui Oxford University College (TOUC) is a four-year private college in Taiwan. During school year of 1997, about 90% of the freshmen had graduated from senior high schools, and the remainder graduated from senior commercial schools (the Academic Affairs Office of TOUC, 1997). One of the major concerns of the faculty in TOUC is the effectiveness of students' learning, which may be influenced by their different post-secondary learning contexts.

Accompanying successful economic development and the government's movement for developing Taiwan as an Asia-Pacific financial center, more and more of a professional financial workforce was needed in Taiwan (Banking Institute of the Republic of China, 1996). Financial management was one of the major courses that the students of business schools were taking to meet the requirements for the job market (Brigham, 1995). Financial management is a high level business course that integrates several related areas, such as economics, accounting, and statistics, etc. (Capon, 1996; Brigham, 1995). Those related courses usually were designated as prerequisite courses for

financial management (Capon, 1996; Bossard & Dewhurst, 1973). According to the curriculum planning of TOUC, the financial management course is offered usually in the junior year or senior year (Tamsui Oxford University College, 1997). Therefore, the students' performance in the finance management class might be influenced by those prerequisite courses during the freshman and sophomore years.

### Statement of the Problem

Since the freshmen of TOUC are coming from two different patterns of post-secondary high school, there may exist differences in academic knowledge, skills, attitudes, and learning styles between the two groups at the beginning of their freshman year. The instructors at TOUC delivered a standardized program to all the college freshmen that came from different post-secondary high schools, therefore, the learning effectiveness of students in certain courses may differ based on their pattern of post-secondary high school. That is, if a high level teaching method or curriculum is applied, the students with less academic knowledge or skills may fare less well during the class; or, the result could be an unchallenging experience for some and leaving the students with more previous academic knowledge or skills bored, unmotivated, and disappointed because they are learning without depth and breadth (Pharr, Bailey, & Dangerfield, 1993; Bossard & Dewhurst, 1973). Moreover, in their upper division years, students of both groups may experience a high level of failure in advanced level classes.

According to the different post-secondary curriculum arrangement for senior high schools and senior commercial high schools, most of the faculty in TOUC believe that the senior high school graduates possess different academic skills and knowledge from the senior commercial high school graduates during the beginning of their first collegial year at TOUC. However, a systematic study of the comparison of college academic performance between senior high school graduates and senior commercial high school graduates is lacking.

### Statement of the Purpose

It is important for their future that business students acquire a broad and solid knowledge in their financial management class. As a high level course in a business school, financial management must be taken after students have finished certain prerequisite courses during their freshman or sophomore year (Tamsui Oxford University College, 1997). The students' performance in those lower level courses might influence their performance in further studies. Thus, as these students have markedly different patterns of post-secondary high school learning experiences, instructors at TOUC are concerned over whether their teaching methods are appropriate for the two different populations in their classes. Therefore, the purpose of this study is to determine whether there were academic performance differences in financial management and related prerequisite courses between the senior high school graduates and the senior commercial high school graduates at the TOUC. Results of this study could be used to assist

instructors in identifying whether the existing difference of post-secondary curriculum arrangement would influence the learning effectiveness of the two groups in certain business courses. Further, the results of this study could be helpful for future research on curriculum development for post-secondary education or teaching method design for higher education in Taiwan.

### The Research Question

This study will compare graduates of senior high schools and senior commercial high schools on their academic performance in financial management and related prerequisite courses at Tamsui Oxford University College (TOUC) in Taiwan. The research question is: To what extent is the academic performance of the students at TOUC in a financial management class as well as its prerequisite courses attributable to the students' different educational background in post-secondary school?

### Subsidiary Questions

The subsidiary questions to be examined in this study are:

1. Are there academic performance differences between senior high school graduates and senior commercial high school graduates on the prerequisite courses that relate to financial management at TOUC?

2. Are there academic performance differences between senior high school graduates and senior commercial high school graduates in the general courses at TOUC?
3. Are there academic performance differences between senior high school graduates and senior commercial high school graduates in the financial management class at TOUC?
4. Is there a relationship between the students' performance in prerequisite courses that relate to financial management and their performance in the financial management at TOUC?
5. Are there learning style differences between senior high school graduates and senior commercial high school graduates at TOUC?

#### Assumptions

One assumption was made in this study:

The faculties of TOUC believed that the two groups in TOUC, the senior commercial high school graduates and the senior high school graduates, have equivalent ability for learning at the very beginning of their first collegial year.

#### Limitation of the Study

The present study is limited primarily because of its causal-comparative (ex post facto) research design insofar as students in the comparison groups (two different patterns



of post-secondary high schools) were not randomly assigned and the independent variable was not manipulated (Gay, 1996).

The study has the following limitation: (1) Since the school year 1997 is the fourth year that the TOUC was reformed from a junior college configuration, the subjects of this study were limited to the juniors in the school year 1997. (2) The financial management course is optional for accounting majors, while it is a requirement for the other three majors in this study. (3) The credit hours of each course in this study have different arrangements among the departments at the TOUC. (4) The responses from the survey items were collected through self-reports of students in the TOUC. The degree of true perception of the self-reporting, therefore, was bound to vary among the respondents.

#### Delimitation of the Study

Because the subjects of this study are limited with respect to the business major students and came solely from the TOUC, the results of this study may apply only to the business major students of the TOUC and certain private academic business colleges. Further, students from other colleges might possess different characteristics.

#### Definition of Terms

**Academic skills:** Academic skills are the basic skills that students mastered as the instruments for the learning in school (Dunn, 1988).

**Curriculum standards:** The MOE prescribes the standards of curriculum and equipment for schools at all levels. As to the textbooks and teaching materials for primary and secondary schools, some are compiled, published, and supplied by the MOE, while some others are published and sold by bookstores after these books and materials are screened and approved by the National Institute of Compilation and Translation (NICT) beforehand (MOE of ROC, 1997a).

**Engaged time:** The time which students actively are engaged in academic responding, which has been found to have a significant relationships to academic performance (Shapiro, 1989).

**General courses:** According to the Standards of Curriculum published by MOE of ROC in 1994 the common courses include: Chinese, English, modern history of China, the thoughts of Dr. Sun Yat-Sen, physical education, and military training. In practice, the so-called common courses include five areas for business college as follows: Chinese, English, calculus, modern history of China, and the thoughts of Dr. Sun Yat-Sen (Wu, 1997).

**Individualization of instruction:** With its emphasis on meeting the needs of all students with their varying abilities, backgrounds, and aptitudes, individualization provides a challenging way to increase the options that are available in providing the best possible learning environment for all students (Murray, 1997).

**Joint College Entrance Examination (JCEE):** JCEE is a nationwide examination system. Each year in Taiwan about 100,000 post-secondary school graduates

engage in a national ritual established in 1954 to determine their futures; by taking the JCEE (Chyu & Smith, 1991).

**Learning Style Inventory (LSI)**: The inventory, which is based on experiential learning theory, measures an individual's relative emphasis on four basic learning modes. The modes are: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Biberman & Buchanan, 1986).

**Metacognition**: The ability to be reflective on one's own thinking or cognitive processes as well as the ability to reflect on the style of learning (Gage & Berliner, 1991).

**Ministry of Education (MOE)**: The MOE is in charge of administrative affairs in connection with academic, cultural and educational matters as pertaining to all schools in Taiwan, R. O. C. (Ministry of Education, R. O. C., 1997a).

**Negative Transfer**: It refers to situations where prior learning interferes with new learning, especially if the new response is incompatible with the old response (Gage & Berliner, 1991).

**Positive Transfer**: It refers to situations where prior learning facilitates or aids subsequent performance (Gage & Berliner, 1991).

**Prerequisite Course**: A prerequisite is a measure of readiness for a course or program that a student is required to meet as a condition of enrolling in a course or program (Academy Senate for California Community Colleges, 1992).

**Recommendatory Selecting Entrance Examination (RSEE)**: Other than JCEE, it is through RSEE that post-secondary school graduates were recruited by colleges that

selected students through the post-secondary high schools' recommendation (The Committee of Recommendatory Selecting Entrance Examination, 1998).

**Senior vocational school:** It is one of the patterns of post-secondary school in the education system of Taiwan; the length of education is three years. Senior vocational schools are categorized into seven specializations, i.e., agriculture, commerce, home economics, industry, marine products, nursing and medical technology, as well as opera and the arts (Ministry of Education, R. O. C., 1997a).

**Tamsui Oxford University College (TOUC):** The TOUC is a four-year private college in Taipei, Taiwan. The student population of TOUC is approximately 3,700. Presently, sixteen departments are included as follows: public finance & taxation, accounting, finance & banking, business administration, sports management, economics, international trade, industrial management, management information system, tourism, information science, foreign language & literature, mathematics, religious studies, applied Japanese, and Taiwanese literature.

**Zero Transfer:** It refers to a situation where no effect can be measured from prior learning on new learning (Gage & Berliner, 1991).

## CHAPTER TWO

### REVIEW OF THE LITERATURE

#### Introduction

The purpose of this chapter is to provide a review and synthesis of the literature related to the theoretical framework, the problem, and the methodology employed for this study. In order to understand the function of post-secondary education in the Republic of China (ROC), Taiwan, this chapter begins with a review of the post-secondary education in the educational system of the ROC. Moreover, the character of two different patterns of post-secondary high schools, senior high school and senior vocational high school in Taiwan, is reviewed.

Following a review of the educational system of the ROC, the review will turn to the transfer of learning theory. The transfer of learning concept is useful in the context of instruction and learning and for the study of student academic performance. More specifically, the theory may provide a viable conceptual framework for studying the influence of college student's post-secondary educational background on their collegial academic performance; and also, two closely interrelated curriculum development concepts, continuity and articulation, are discussed as a concern about the issue of the transfer of learning in this section. Finally, the review will focus on the body of literature

concerned with the issue of academic skills, previous learned knowledge, learning style and study skills, as well the effectiveness of the learning of students.

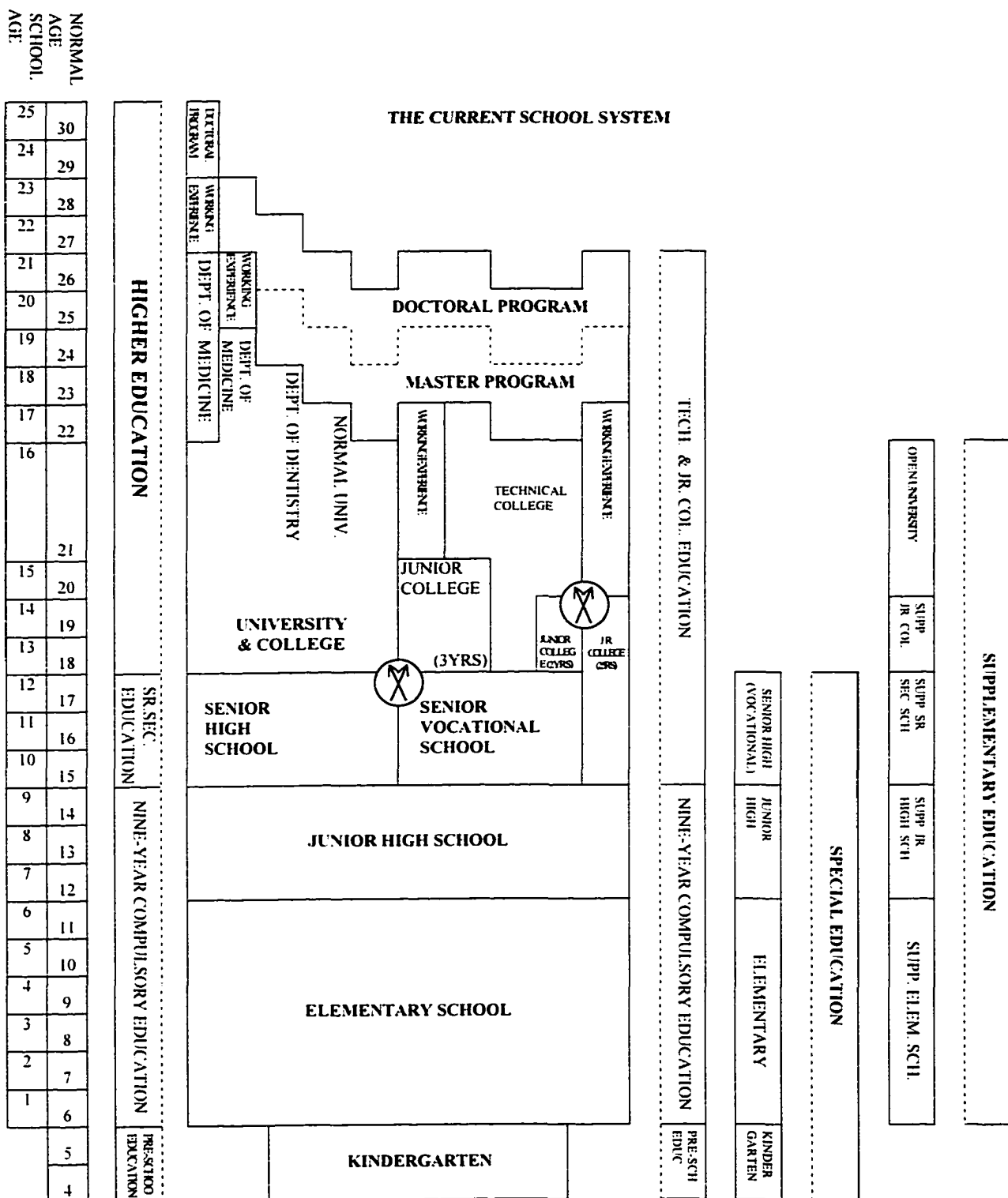
### Post-Secondary Education in Taiwan, ROC

#### The Role of Post-Secondary Education in Taiwan

In Taiwan, education from kindergarten through the graduate study requires about 22 years (See Figure 1). The length of education is flexible, depending on individual cases. Usually, the entire education includes two years of kindergarten, six years of elementary education, three years of junior high education, three years of senior secondary education, four to seven years of college or university education for a bachelor's degree, one to four years of graduate program for Master's degree, and two to seven years of doctorate-degree graduate program (Ministry of Education, R. O. C., 1997a).

The secondary school is the tertiary level of education for many students in Taiwan and the connecting link between primary education and higher education. In 1968, when junior high school was made available to all pupils who had completed the sixth year of education, that level of education became part of a continuum of the primary elementary educative process (Chyu & Smith, 1991). Post-secondary education is offered by three patterns of institutions: the senior high schools, the senior vocational high schools, and the five-year junior colleges. Students of both senior high school and senior vocational school are generally required to take three years of education. A diploma is

**Figure 1**  
**The School System of Taiwan, Republic of China**



Source: Ministry of Education, R. O. C. (1997a), p.8.

conferred on students upon graduation. A certificate is conferred on five-year junior college students when they complete at least 220 credits; usually, it takes no less than five years to earn the certificate (Ministry of Education, R. O. C., 1997a; Boyd & Lee, 1994).

Like most East Asian students, the Taiwanese student's future is determined by academic examinations. At age 15, each junior high school graduate may take each of the regional entrance examinations for the three different patterns of post-secondary education. The student entering each pattern of school has the opportunity to pursue a university education as well as a more technical-based education (Boyd & Lee, 1994). While completing three-year post-secondary education, the graduate of senior high school and senior vocational school may become a freshman in university by having passed the Joint College Entrance Examination (JCEE) or the Recommendatory Selecting Entrance Examination (RSEE); whereas the five-year junior college graduate may begin his or her sophomore study at university as a transfer-student (Ministry of Education, R. O. C., 1997a; Wu, 1997).

### Curriculum of Post-Secondary Education

The curriculum standards for schools at different levels are set primarily according to the aim and the policy of education of the country all determined by the MOE (Ministry of Education, R. O. C., 1997a). Along with development of the economy, these standards may be adjusted from time to time in order to meet the changing needs of the society, to catch up with the progress of the time, and ultimately to achieve the great success potential of education (Yung & Welch, 1991). To fulfill the given responsibility,



the senior high school curriculum was developed based on two primary objectives: to introduce the student to academic subject matter (that prepares him or her for the JCEE) and to create in the student a sense of moral and ethical uprightness (Ministry of Education, R. O. C., 1997b; Chyu & Smith, 1991). In Taiwan, a high school student was required to have a major area of emphasis. Two fields were available: natural sciences and social sciences. When the student graduated from high school and sat for the JCEE, he or she indicated which of these fields was his or her choice and took an examination in that area (Chyu & Smith, 1991).

In senior high schools, total credit hours were 214 to 230 (See Table 1). The subject arrangement in the senior high school curriculum were divided into academic subject matter, the arts, social sciences, and natural sciences (Ministry of Education, R. O. C., 1997a). However, the major objective of senior high school students was to pass the JCEE. To prepare for the JCEE, senior high school students usually take all of the elective courses, for a total of 50 credit hours, in four academic subject matters, i.e., Chinese, mathematics, science, and social studies (Ministry of Education, R. O. C., 1997a; Chyu & Smith, 1991).

The senior vocational high school has as its purpose to educate the youth with vocational knowledge and skills as well as business ethics and to turn them into basic skilled workers (Boyd & Lee, 1994; Yung & Welch, 1991). By the school year 1996, the number of senior vocational high schools in Taiwan were 204. Senior vocational students totaled 520,153 of which 42.21% were majoring in industry, 38.38% in commerce, 3.69% in agriculture, and 15.26% in marine products, medicine and nursery, home

Table 1

Teaching Subjects and Weekly Teaching Hours in Senior High Schools

Semester Subject	Grade 1		Grade 2		Grade 3	
	I	II	I	II	I	II
Chinese	5	5	5	5	6	6
English	5	5	5	5	6	6
Civics	2	2	2	2		
Three Principles of the People					2	2
History	2	2	2	2		
Geography	2	2	2	2		
Mathematics	5	5	4	4		
Basic Science	6	6				
Physics I			3	3		
Chemistry I			3	3		
Biology I			3	3		
Earth Science I			3	3		
Physical Education	2	2	2	2	2	2
Music	1	1	1	1		
Fine Arts	1	1	1	1		
Industrial Arts	2	2	2	2		
Home Economics	2	2	2	2		
Military Training (Military Training & Nursing for girls)	2	2	2	2	2	2
Class Meeting	1	1	1	1	1	1
Group Activities	1	1	1	1	1	1
Elective Courses:						
Languages						
Social Sciences			3	3	14	14
Mathematics			1	1	1	1
Natural Sciences			6	6	19	19
Fine Arts						
Physical education						
Total	37	37	36 39	36 39	34 39	34 39

Notes:

In the second year of senior high schools, natural science is divided into four courses-Physics, Chemistry, Biology, and Earth Science. The student must select one or two courses out of three-hour weekly.

In the first and second year, the student must select either Industrial Arts or Home Economics with two-hour study weekly.

Source: Ministry of Education, R. O. C. (1997a), p.33.

Table 2

**Teaching Subjects and Weekly Teaching Hours in Senior Commercial High Schools**

Subject	Grade		2		3	
	I	II	I	II	I	II
<b>Compulsory Courses &amp; Basic Studies</b>						
Chinese	4	4	3	3	3	3
English	2	2	2	2	2	2
Three Principles of the People					2	2
Concept of Natural Science			2	2		
Concept of Social Science	2	2	2	2		
Mathematics	3	3	3	3		
Physical Education	2	2	2	2	2	2
Music	1	1				
Arts			1	1		
Military Training	2	2	2	2	2	2
Basic Concept of Computer			2	2		
Accounting	3	3				
Introduction to Commerce	2	2				
Economics	3	3				
English Typing	2	2				
<b>Elective &amp; Special Courses</b>						
Abacus						
Money & Banking						
Statistics						
Business Management						
Marketing						
Cost Accounting						
Advertisement Theory						
Data Processing						
Civil Law	9	9	16	16	24	24
Commercial law						
Commercial English						
Economic Geography						
English Conversation						
International Trade & Exchange						
Commercial Psychology						
Commercial Etiquette						
Class Meeting	1	1	1	1	1	1
Group Activities	1	1	1	1	1	1
<b>Total</b>	<b>37</b>	<b>37</b>	<b>37</b>	<b>37</b>	<b>37</b>	<b>37</b>

Source: Ministry of Education, R. O. C. (1997a), p.34.

economics, or opera and the arts (Ministry of Education, R. O. C., 1997b). Under the present education system, a senior vocational high school graduate may choose to take a job or continue pursuing education at an institute of technology which admits only senior vocational graduates and junior college graduates, or a university, or a two-year junior college, after passing the relevant entrance examination (Ministry of Education, R. O. C., 1997a; Boyd & Lee, 1994).

According to the promulgation of MOE (1987), *Commercial High School Curriculum Standards and Equipment Standards*, the total credit hours in senior commercial high school were 216, which included 46 credit hours in compulsory business subjects, 74 credit hours in elective business subjects, and the rest in basic studies (See Table 2). Comparing the curriculum of senior high school and commercial high school, a significant difference was revealed (See Table 1 & 2). As Table 1 and Table 2 show, the senior high school student took academic subject matter courses, such as Chinese, mathematics, and English, far more than the commercial high school student. Conversely, the commercial high school student took a total of 120 credit hours in business related courses, while none of the business course were taken by the senior high school student.

### College Entrance

All students who wish to be admitted to any of the universities or four-year colleges must sit for the JCEE in early July. The examination covers six subjects, of which four are common to all applicants: Chinese, mathematics, English, and the doctrine

Table 3

Student Enrollment at TOUC in School Year 1997

Semester Department	Freshman			Sophomore			Junior			Senior		
	A	B	C	A	B	C	A	B	C	A	B	C
PT	6	104	0	9	52	1	5	31	10	3	28	15
AC	16	93	0	5	106	1	5	22	24	3	17	19
BA	15	99	0	7	63	56	16	47	35	3	45	38
FB	13	100	0	4	45	17	10	22	13	5	26	15
SM	6	48	0	4	29	17	1	22	24	0	0	0
IM	14	98	0	5	34	29	5	20	19	1	33	16
IT	12	97	0	12	114	0	18	75	0	3	95	2
EC	1	40	0	0	0	0	0	0	0	0	0	0
MI	17	94	0	9	64	52	17	50	30	3	52	43
TR	13	103	0	12	90	25	8	63	26	3	61	35
IS	5	108	0	0	33	15	0	0	0	0	0	0
FL	11	102	0	3	32	15	1	30	15	0	0	0
MA	4	46	0	0	35	6	0	18	9	0	0	0
RS	4	50	0	0	17	18	0	0	0	0	0	0
AJ	5	41	0	0	0	0	0	0	0	0	0	0
TL	3	41	0	0	0	0	0	0	0	0	0	0

Notes: code for department and student status

PT = public finance and taxation, AC = accounting, FB = finance and banking, BA = business administration.

SM = sports management, EC = economics, IT = international trade, IM = industrial management,

MI = management information system, TR = tourism, IS = information science.

FL = foreign language and literature, MA = mathematics, RS = religious studies, AJ = applied Japanese,

TL = Taiwanese literature.

A = commercial high school graduate, B = senior high school graduate, C = transfer student.

Source: Academic Affairs Office of Tamsui Oxford University College (1997).

of Sun Yat-Sen. The remaining tests are on two subjects that are part of a group chosen by the applicant. History and geography are the two subjects for the examinee who wants to be a business major student (Epstein & Kuo, 1991; Wu, 1997). Thus, it is inferred that the senior high school graduates should outperform the senior commercial high school graduates in the JCEE since the former have taken more academic subject matter courses than the latter during their post-secondary school years (Wu, 1997). The source of the student population in TOUC may reflect this difference. However, a trend shows that there were more and more senior commercial high school graduates entering business college by having passed the JCEE and the RSEE (See Table 3). Through the passage of RSEE, the senior commercial high school graduates can demonstrate their strength and avoid taking the JCEE which may expose their weakness in preparation in certain areas (Wu, 1997).

### Transfer of Learning Theory

#### The Concept of Transfer

Retrieval of what is learned does not always occur in the same situation or within the same context that surrounded the previous learning (Gagne & Driscoll, 1988). The process that enables us to make previously learned responses in new situations is called transfer. According to Gagne and Driscoll (1988), the recall of what has been learned and its application to new and different situations is referred to as transfer of learning, or shortened to transfer. Ellis (1972) defined transfer as the influence of previous learning

on performance in some new circumstances. "Transfer often, but not always, allows us to perform sensibly and adequately in a new task" (Gage and Berliner, 1991, p.306). It is obvious that transfer is at the heart of education and it is a goal of school learning (Tanner & Tanner, 1980). In his discussion of eight perennial problems of curriculum development, Oliva (1992) referred to "transfer of learning" as "transferability." Oliva (1992) addressed the issue as follows:

Whatever is taught in school should in some way possess transfer value. That is, learning in school should have applicability in either a broad or narrow sense outside of school and after school years. Education for education's sake — the mark of the learned person — is simply not sufficient as a goal of education. (p. 525)

Vocational education is a good example of a field that has a built-in opportunity for transfer of learning. It is obvious that we can see the transfer of skill in such areas as art education, music education, typing, and home economics, etc. Students learn those skills in classes and then transfer them to the real life or the world of work. In addition, transfer of cognitive learning is frequently visible in student performance on assessment and standardized tests (Oliva, 1992).

Collins (1990) cited Ellis (1965) stating that "transfer of skill is a practical issue for education and a fundamental issue for psychology, but, though a number of studies have been guided, little is known about why transfer either occurs or fails to occur" (p. 18). Further, Ellis (1972) pointed out that transfer effects could be positive, negative, or zero, if no effect was observed. However, learning conditions can be varied by

manipulating contexts and contents of problems to be worked on, so that transferability of knowledge can be dramatically increased (Catrambone & Holyoak, 1989). Also, Oliva (1992) conceived that transfer can be improved and increased if teachers consciously teach for transfer.

### Traditional View of Transfer

The traditional view of transfer was addressed early in this century by the eminent educational psychologist, Edward L. Thorndike (Gage & Berliner, 1991). Thorndike, reflecting on transfer of learning, advised that even small degrees of learning may be of great educational value if that learning was extended over a wider field (Haslerud, 1972). Based on the research of Thorndike and Woodworth (1901), Gage and Berliner (1991) stated that "...if the stimuli in two situations are similar and the same responses are called for, transfer should take place. The more the elements of one situation are identical with those of another, the greater the transfer" (p. 307). Further, Gage and Berliner (1991) pointed out that, "Thorndike's theory that identical elements account for the phenomenon of transfer was widely advocated, but mainly in its narrowest form — one-to-one correspondence between the elements of what was studied and what was to be done in real life" (p. 308).

Thorndike's thinking was very different from the belief of formal discipline that asserted the value of studying certain subjects because they train the mind (Gage & Berliner, 1991). According to Oliva (1992), some psychologists upheld that rigorous subjects disciplined the mind; therefore such education was generally transferable. In



addition, some of the psychologists have held that education is the storing of data for use at a later date when the occasion arises. However, sometimes people try to retrieve the stored data, and they might find that it is gone (Tanner, 1972).

In the 1920s, Thorndike started to refute the belief of formal discipline. In a series of studies at the high school level he found no evidence that any one course of study was superior, in terms of transfer, to any other. He concluded that those who have the most intellectual ability to begin with gain the most during the year (Oliva, 1992). Tanner and Tanner (1980) also pointed out that the Eight-Year Study disproved the belief that certain subjects lead to transfer:

But probably the most stunning attack (aside from Thorndike's 1924 study) on the idea that certain subjects have superior transfer to intelligence was delivered by the Progressive Education Association's Eight-Year Study.... the study proved that success in college is not dependent on credits earned in high school in prescribed subjects. (p. 323)

Oliva (1992) stated that, according to Taba, "the recent ideas on transfer have returned to earlier assumptions of the possibility of fairly wide transfer, depending on the level of generalizing that takes place regarding either the content or the method of approach" (p. 527). Another definition of transfer postulated by Gelzheiser (1986) is that generalization is one of the basic and essential criteria used to evaluate learning. Here, generalization refers to the process in which an activity or response extends adaptability from similar to highly differentiated environments (Singer and Pease, 1976).

Some educators believed that generalizations and principles are the key elements in the transfer of what is learned in one situation to performance in another situation (Gagne & Driscoll, 1988). A famous study of transfer was performed many years ago (Judd, 1908) and redone later by Hendrickson and Schroeder (1941). The researchers, Judd, Hendrickson and Schroeder, experimented with the teaching of principles in a general sense that facilitated solving many problems and learning many things that seemed very different (Gage & Berliner, 1991). They concluded that, if teachers wish to foster students' transferability, general principles should be stressed (Oliva, 1992).

#### Contemporary Thought on Transfer and Metacognition

Current psychologists shift the focus of the transfer of learning concept to the thought process of people who show the competence to transfer learning (Segal, Chipman, & Glaser, 1985). This change led the cognitive psychologists to look for the answer to the following questions: (1) What is it that people demonstrate as an adequate transfer ability that helps people connect with previous learning and the new condition?; (2) What and how can we teach the skill to help other people who are lacking transfer ability? (Flavell, 1976; Brown, 1978; Segal, Chipman, & Glaser, 1985).

Brown (1981) asserted that there are two important aspects during learning and transfer. They are knowledge about cognition and regulation of cognition. Knowledge about cognition is the knowledge learners have about their own cognitive resources, themselves as learners and about the learning tasks; regulation of cognition includes the skills such as goal setting, planning, controlling, evaluating, and modifying

(Puntambekar, 1995). Gagne and Driscoll (1988) defined cognitive strategies as “the way by which learners guide their attending, learning, remembering, and thinking. Our abilities to engage in these self-monitoring, self-guiding activities make possible executive control” (p. 55). In other words, cognitive strategies regulate our individual ways of dealing with the environment by influencing internal processes. Cognitive strategies that are more general in their control of intellectual processes have been called executive or metacognitive strategies (Derry & Murphy, 1986).

Metacognition is revealed as thoughts about what we know and thoughts about regulating how we go about learning (Brown, 1978). It is a monitoring process we use when we are thinking, learning, and remembering (Brown, Armbruster, & Baker, 1985; Fogarty, 1994). There are two core meanings of the term metacognition to which most researchers using that label often refer: monitoring and control of cognitive processes (Reder & Schunn, 1996). In order to train learners to think about what they are doing, Brown (1978) suggested that learners should be taught to ask themselves questions such as: (1) should I stop and think, (2) do I know what to do, (3) is there anything more I need to know before I begin, and (4) is there anything that I already know that will help me?

According to Brown and Palincsar (1982), when compared with average students, mentally handicapped and learning disabled students sometimes show a metacognitive shortage. However, metacognition can be developed through experience and explicit instruction. In their study, to make up for what seemed to be a lack of metacognitive skills, Brown and Palincsar (1982) gave students intensive corrective feedback when they tried to answer comprehension questions. They praised the students for proper responding

and taught them how to change the wrong responses. Then the students learned study strategies; that is, the students learned metacognitive skills to use when learning.

Therefore, when learners experience the need for problem-solving strategies, they should induce their own, confer about them, and practice them to the phase that they become spontaneous and unconscious. Then their metacognition skills will be improved (Sternberg, 1985). Metacognition is necessary for classifying problems, representing problems visually in our minds, and retrieving the solutions to problems from memory (Fogarty, 1994). It is important to help students foster transfer (Corte, 1996). It is obvious that the student's academic performance can be attributed to this ability to transfer learning. With the higher ability of transfer of learning, college students can successfully apply the skills and knowledge learned from previous education to their learning in college.

#### Study Findings Related to Transfer of Learning

According to Hull (1992), Hsu & Chen (1992), and Wu's (1997) studies, a strong foundation in mathematics as well as calculus are essential to succeed in advanced education. The findings of those studies implied that the students who possess a certain skill can transfer or apply to a certain extent in other fields or advanced learning. Chen (1984) focused on the importance of related task transfer of skills and learning in elementary physics. The college students were measured for both achievement and attitude changes in their performance. As students began to learn how to apply and transfer their readings in physics to other subject matter, significant improvements were

found. Kosonen and Winnie (1995) conducted three experiments with 276 college, secondary, and middle-school students in teaching abstract rules. Results of the research support a revival of formalist views of transfer: that teaching formal rules about inference making can improve reasoning and support transfer.

In their study, Rogoff and Gauvain (1984) conceived that transfer of skills to related tasks are occurrences that everyone participates in everyday. Individuals would be *extremely limited if they could only administer learned matter to identical problems that were performed repeatedly*. Further, Ellis (1972) suggested that individuals must actively seek analogies across problems to lead them to finding similarities. Rogoff and Gauvain (1984) pointed out that formal schooling was viewed as the one experience in life that provided a learning to learn ability where people were taught the ability to transfer skills and information to new situations. Therefore, as Rogoff and Gauvain (1984) asserted, school skills may not transfer any more widely than nonschool skills.

A number of research studies were concerned with the need to induce skill transfer. The results of Wang's (1998) study showed no significant interaction between the strategies and genders in transfer of learning. However, the results reported that females were hindered by encapsulation strategy, while males were hindered by integration strategy. Singer and Suwanthada (1986) concluded in their study that learners would be more effective if they learned how to learn, and any gain of metacognition would help the process. They believed that metacognition would facilitate in the generalization process. Regarding the metacognitive aspects of problem solving, Flavell (1981) advised that the more a student knows proper methods and styles of thinking

about thinking the better functioning of their own cognitive process will follow. Haslerud (1972) suggested that transfer is the key to learning, retention, and the ability to adjust to an ever-changing environment. The general consensus from these studies reflects the view that learning how to learn is more beneficial to transfer of learning than specific content learning.

### Bridging Higher and Secondary Education — Continuity and Articulation

As a stepping-stone for higher education, post-secondary education bears the responsibility to adopt an appropriate curriculum that would facilitate the student to prepare for future studies (Tanner, 1972; Keller, 1969). While associated with the linkage of higher education and post-secondary education, except for transferability, two out of eight perennial problems of curriculum development should be considered. These are continuity and articulation (Oliva, 1992; Tanner, 1972; Keller, 1969).

### Continuity

In Recommendation 16, The Carnegie Commission on Higher Education (1973) asserted that “...the relationship of general education at the high school to that at the college level...should be explored with a view toward ways that the general education requirements at both levels might be linked together to provide continuity...” (p. 69-70). Continuity is the schemed repetition of content at continuous levels, each time at an increased level of sophistication and complexity (Saylor, Alexander, & Lewis, 1981). In

his book, *Basic Principles of Curriculum and Instruction*, Ralph W. Tyler (1969) defined continuity as follows:

Continuity refers to the vertical reiteration of major curriculum elements. For example, if in the social studies the development of skills in reading social studies is an important objective, it is necessary to see that there is recurring and continuing opportunity for these skills to be practiced and developed. This means that over time the same kinds of skills will be brought into continuing operation. In similar fashion, if an objective in science is to develop a meaningful concept of energy, it is important that this concept be dealt with again and again in various parts of the science course. Continuity is thus seen to be a major factor in effective vertical organization. (p. 84-85)

Moreover, Oliva (1992) cited Saylor et al. (1981) stated "the principle of continuity is represented in what has been called the spiral curriculum. Concepts, skills, and knowledge are introduced and reintroduced..." (p. 523). Bruner (1966) considered that effective learning was most likely to occur when learners were exposed to subject content a number of times and when the basic skills were returned to with additional complexity as learners develop and move through a course. This is the concept underlying the spiral curriculum which relates not only to the vertical integration or deepening of knowledge but also to the horizontal integration or widening of knowledge (Tanner & Tanner, 1980; Cornford, 1997).

In general, the spiral curriculum links subjects together so that learners have the prerequisite knowledge and skills for each successive lesson. When learners are exposed

to a steadily increasing level of difficulty and complexity of lesson materials, the previous learned knowledge and skills can be transferred to the higher level lessons (Dowding, 1993). Thus, due to the well-developed high school curriculum in Taiwan, every senior high school graduate should have gained certain skills and knowledge from classes in high school years. These are the instruments that senior high school graduates have as preparation for their future studies in college (Keller, 1969).

### Articulation

Along with continuity, articulation is another dimensions of sequencing (Oliva, 1992). According to Tanner & Tanner (1980), the concept of “continuity” is equated with “vertical articulation” and the concept of “articulation” with “horizontal articulation” or “correlation.” However, Oliva (1992) separated continuity from vertical articulation and defined continuity as a reintroduction of content at progressively more complex levels. Oliva agreed with calling correlation horizontal articulation; he addressed the concept of “articulation” with “vertical articulation.” In his book, *Developing the Curriculum*, Oliva (1992) described articulation as follows:

If we view continuity as the spiraling of content upward through the grades of a particular school, we should view articulation as the meshing of organizing elements across school levels — that is, across elementary and middle or junior high schools, across junior high or middle and senior high schools, and across senior high school and college. (p. 524)



In the business program in Taiwan's college courses, the competencies to be achieved and the skill levels designated are usually specific and very measurable. These characteristics facilitate articulating courses and building students' skill-level development from course to course and from one education level to another (Warmbrod, 1987). Further, Warmbrod (1987) stated that "articulation enables instructors and students to see when a secondary school course equates with a beginning or intermediate course at the college level. This is particularly true of business programs in secretarial science, accounting, and business data processing" (p. 101). From this point of view, in Taiwan, the senior commercial high school graduate might achieve better than the senior high school graduate in certain business courses during the freshman year.

According to the concepts of continuity and articulation, it seems to take for granted that a post-secondary school graduate can apply what he or she had learned in the high school to the college classes. However, the study that Thorndike (1901) conducted with Woodworth showed that transfer could occur but not because of disciplinary value of any classical study; transfer would occur only if the previous and new activities had general content or methods of study.

Wesman (1945) reported that the findings of his study "fail to reveal superior transfer to intelligence for any one of the achievement areas measured (Latin, German, French, mathematics, natural science, social studies, contemporary affairs) and indicated the desirability of direct training in mental processes rather than dependence on transfer from school subjects" (p. 391). Also, we can see from the Progressive Education

Association's Eight-Year Study that success in college is not dependent on credits earned in high school in prescribed subjects (Tanner & Tanner, 1980).

### Academic Skills

Academic skills are the basic skills that students master as the instruments for learning in school (Dunn, 1988). Pinar et al. (1995) cited in Kliebard (1986), pointed out that "academic skills are believed to have transfer value to other settings, such as work settings" (p. 31). Knowledge of previous academic accomplishments is useful in helping students overcome learning difficulties and in selecting competencies that are realistic in terms of the learner's abilities (Popham, Schrag, & Blockhus, 1975). Thus, schools at all levels are engaged in massive efforts to raise student achievement in the subject areas. Basic skills for college students are those the students needs in order to embark on a college education (The Carnegie Foundation for the Advancement of Teaching, 1977). The basic academic skills include the skills associated with reading, writing, and mathematics (Dunn, 1988).

In the preface of his book, *Academic Skills Problems: Direct Assessment and Intervention*, Shapiro (1989) conceived that "failure to master academic skills remains one of the most troublesome problems referred to multidisciplinary teams" (p. v). Students who do not learn sufficiently in early school years to read, spell, express themselves through writing, or do mathematics computations will have major problems throughout their higher education careers. Moreover, failure to master these basic skills

can often result in the development of school-related problems and place students at risk for dropping out (Shapiro, 1989).

### Academic Skills for College-Level

It is difficult for either the high school or the college and university systems to speak clearly about a standard of academic achievement that should be met by all students planning to enter college. Nevertheless, The Carnegie Foundation for the Advancement of Teaching (1977) asserted that there are two things that should be possible for state systems of higher education to at least identify. First are the proficiency levels in reading, writing, and mathematics a student needs to begin a college career; second, those subjects on which a college curriculum builds and to which every entering student should have had at least some exposure.

In the United States, the College-Level Academic Skills Test (CLAST) was applied as an instrument by which the lower division student's academic skills would be measured to ensure that the student met the required college-level skills prior to entering the upper division (Florida State Department of Education, 1991). According to the *CLAST Technical Report* (Florida State Department of Education, 1985), the test is intended to measure whether or not students have achieved certain computation and communication skills prior to graduation. Thus, the CLAST is a major factor in determining which students will successfully complete upper division education in the university.

In Florida, the academic skills measured were identified by faculty from the community colleges and the state universities (Wright, 1992). Four generic skills for each of the two domains, computation and communication, were identified by a task force. The computation skills involved algorithms, concepts, generalizations, and problem solving. In communication, those are reading, listening, writing, and speaking (Florida State Department of Education, 1985). There is no analogous test in Taiwan to measure the academic skills of high school graduates and lower division college students. However, in 1975 the MOE conducted an extensive study of the relationship between senior high school academic performance and scores on the JCEE, the correlation of scores with later scholastic achievement in college, relations among selected socio-economic variables as predictors of JECC success, and failure and success patterns since the system's inception (Republic of China, 1978). The findings suggested, in fact, that JCEE performance correlated most highly with high school academic achievement (Epstein & Kuo, 1991). Therefore, the MOE believed that the existing examinations, JCEE, were viable instruments to measure the academic skills of students even though that was not the main purpose of the examinations (Smith, 1991; Boyd & Lee, 1994).

#### Academic Skills from Different Educational Background

To prepare for the JCEE and the following higher education, senior high school students in Taiwan spend most of their time in certain academic subject matter, such as Chinese, mathematics, and English, during high school years (Smith, 1991; Chyu & Smith, 1991; Epstein & Kuo, 1991). According to Shapiro (1989), much of the research

that concerned the critical instructional variables affecting student mastery of basic skills was derived from Carroll's (1963) model of classroom learning; the model hypothesized that learning is a function of time engaged in learning relative to the time needed to learn. Frederick, Walberg, and Rasher (1979) examined engaged time and scores on the Iowa Tests of Basic Skills among 175 classrooms in Chicago and found engagement rates and achievement scores to be fairly correlated. Gettinger (1986) noted that there appears to be "a positive association between academic engaged time and learning" (p. 9). It is obvious that, as Shapiro (1989) stated, "any assessment of academic skills must include a variable that either assesses engaged time directly or provides a close approximation of engaged rate" (p. 28). From this point of view, when analyzing both curriculum of the senior high school and commercial high school in Taiwan (See Table 3 & 4), the assumption can be made that the senior high school graduate possesses more basic academic skills than the commercial high school graduate does during their first year in college. The former spends more time on academic classes than the latter.

On the other hand, Taylor (1989) stressed that a well-developed business curriculum provided the opportunity for the student to attain certain basic skills such as reading, writing, speaking/listening, and computing. Taylor believed that most business courses contribute to the development of students' ability to read, speak, and write or their ability to communicate effectively. For example, by the nature of their content, business English and business communications courses specifically develop most of these basic skills. Computing skills involve developing the ability of individuals to solve arithmetic problems that they encounter as ordinary citizens in their homes, their jobs, the

marketplace, and other aspects of their daily lives (Taylor. 1989). Therefore, while senior commercial high school graduates completed numbers of basic business courses, senior high school graduates did not, and there might be an advantage among senior commercial high school graduates over senior high school graduates in their first year in business college.

According to *Commercial High School Curriculum Standards and Equipment Standards*, the commercial high school student in Taiwan had to take courses such as document writing, business English, shorthand, and business communication, that would reinforce the student's communication skills (Ministry of Education, R. O. C., 1987). Even though the curriculum between the two patterns of post-secondary high schools in Taiwan is dramatically different, it seems that the basic academic skills of the senior commercial high school student is not necessarily less advanced than that of the senior high school student.

## Learning Style

### Conceptions of Learning Style

According to Dewey (1938), learning is a process integrating experience and concepts, observations, and action. With correspondence to Piaget's (1970) figurative and operative aspects of thought, Kolb (1984) defined learning as a "process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping experience and transforming it" (p. 41). Learning typically

involves interaction with external circumstances. It is inferred when a change occurs and persists over relatively long periods during the life of the individual (Gagne & Driscoll, 1988).

Educational psychologists generally agree that every individual has a unique approach to learning (Gilley & Egglund, 1989). Learning styles are described in many ways. Cornett (1983) defined learning styles as the overall patterns that provide direction to learning and teaching. Smith (1982) defined learning style as the “ individual’s characteristic ways of processing information, feeling, and behaving in learning situations” (p. 24). Kember et al. (1995) asserted that an awareness of the student’s own learning process is a valuable step toward enhancing the effectiveness of learning processes and improving the quality of learning effects. Honey and Mumford (1986) proposed that managers can become more effective through an awareness of their own learning styles.

Biberman and Buchanan’s (1986) study, *Learning Style and Study Skills Differences across Business and Other Academic Majors*, found existing differences at the University of Scranton between business majors and other academic majors in learning style and study skills. Hull (1992) reported that as schools of business become more research and theory oriented, schools face the challenge of bringing the knowledge to the students in a usable form so that the gap between the production and utilization of knowledge may be bridged. Paulsen and Gentry (1995) found that the relationship between learning strategy and academic performance was significantly related. Holley and Jenkins (1993) used Kolb’s Learning Style Inventory 1985 to compare college

accounting students' learning style preferences to their performance on different types of exam question formats. Their research showed that the student with each different learning style performed better on certain types of exam. These findings led to the implication that there might also exist differences between commercial high school graduates and senior high school graduates in learning style and study skills. Therefore, the students' effectiveness of learning transfer and their following academic performance may be influenced by their learning style. If student's learning style matches the external environment, such as teacher's teaching style or curriculum arrangement, the performance of the student may be better than the other students who did not adopt a suitable learning style to meet the external environment.

#### Categories of Learning Style

Murray (1997) stated that "there are styles proven to be more effective during certain circumstances and with certain personalities" (p. 123). Murray (1997) categorized learning styles into three areas: cognitive, affective, and physiological. Dunn and Dunn (1978) described that the physiological approach is based upon how the learner reacts to the physical environment. The affective learning approach is an emotional characteristic such as learner locus of control and how the learner interacts with peers during the learning process (Dunn & Dunn, 1978). Messick (1976) described cognitive learning style as the way a person perceives, remembers, and solves problems and focuses upon "how I learn" rather than "what I learn." Whittrock (1990) categorized learning styles into four types as follows:



- (1). The imaginative learners utilize listening and the sharing of ideas to learn....
  - (2). The analytical learners develop theories by integrating what they know with what they observe....
  - (3). The common sense learners integrate theory and practice and are pragmatic....
  - (4). The dynamic learners learn by trial and error.
- (p. 114-115)

### Teaching Styles and Student's Learning Styles

Each model of teaching can be seen as a model of learning, which is a method of support learners use to expand their styles of approaching problems now and in their future (Joyce & Weil, 1996). There are a great variety of teaching and learning styles, and, in fact, there are no accurate methods to teach or learn (Murray, 1997). However, while concerned with student's learning effectiveness, Murray (1997) declared that "teachers should recognize that because students have different strengths and learning styles, they should tailor instruction to accommodate these" (p. 123). When teachers realize that students have different learning styles, they are in a position to teach students in ways they learn best. Teachers will then be able to develop an integrated framework of instructional strategies and classroom activities that they feel fit their students, their own teaching styles, and content areas (Filbeck & Smith, 1996; Drennan & Sawyer, 1992).

Psychologists believed that learning is frequently accompanied or compelled by discomfort (Joyce & Weil, 1996). Carl Rogers (1969) persisted in the idea of providing a safe place for learners to explore learning environments. He conceived that a major task of teachers was to support the learner to access those domains that are shrouded in fear of

learning. Maslow (1962) described self-actualization as a state that not only urged people to venture and take risks, but also to bear the inevitable discomfort felt when endeavoring to use unfamiliar skills. Hunt (1971) declared that discomfort was a precursor to growth.

While learning is inevitably confronted with discomfort, Joyce and Weil (1996) defined “marginal learners” as the learners who experience great discomfort in the environments in which they find themselves. Namely, in marginal circumstances a learner has difficulty relating to an educational environment and profiting from it. There are no special methods for marginal learners. However, Hunt (1971) suggested that teachers should search for the approaches to teaching in which the learners are least marginal, and then employ them. Joyce and Weil (1996) asserted that the uncomfortable learning condition can be mitigated by adapting teaching styles to conform to the characteristics of the learners.

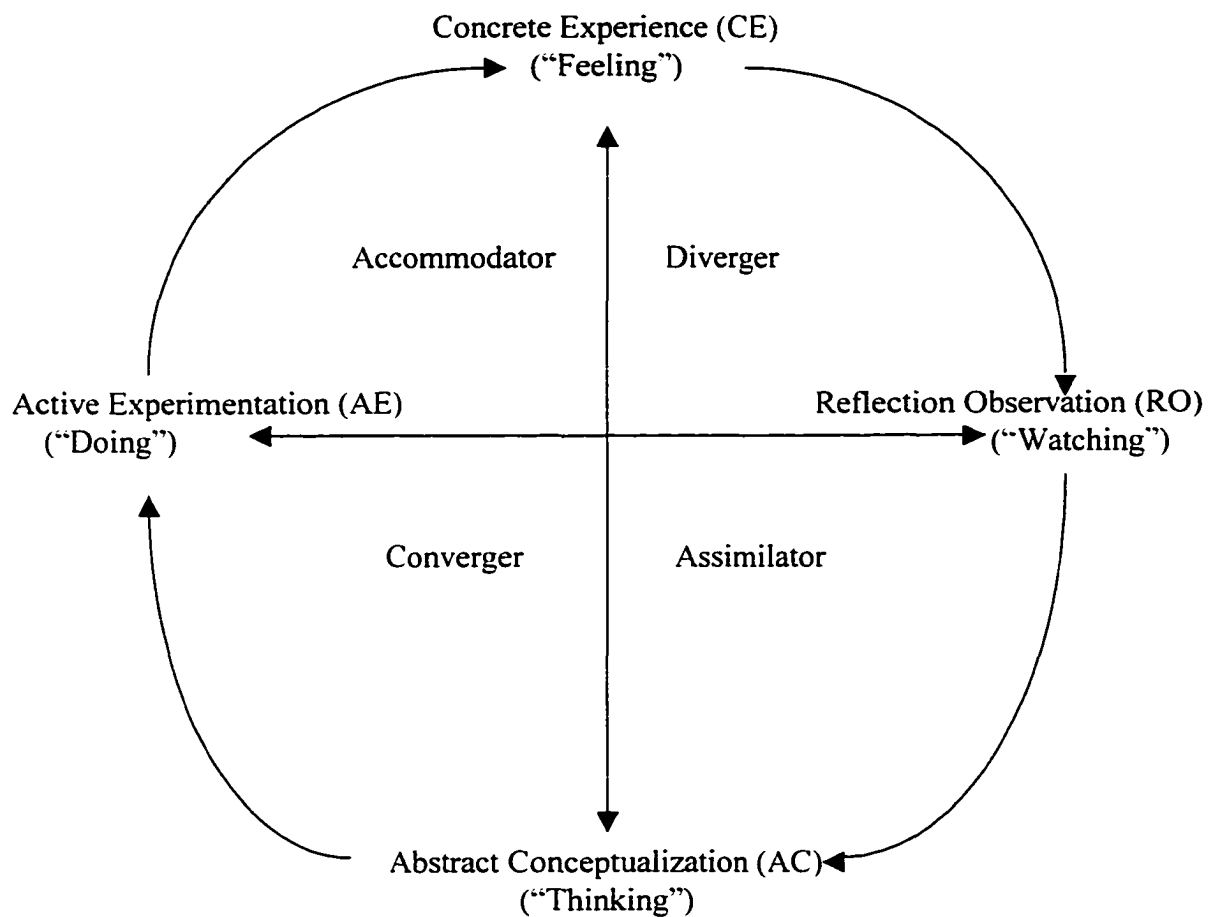
### Learning Style Inventory (LSI)

According to Murrell and Claxton (1987), the foundation for the development of numerous learning style inventories relied on the findings of Dewey (1938), Lewin (1951), and Piaget’s studies (1971). Some of these instruments include Kolb’s Learning Style Inventory, the Myers-Briggs Type Indicator, 4MAT, Honey and Mumford’s Learning Style Questionnaire, and Dunn’s Learning Style Inventory (Murrell & Claxton, 1987; Kember, Sivan, & Davies, 1995). While there are actually several different measures of learning style (Holley & Jenkins, 1993; Ferrell, 1983), Kolb’s LSI is “one of

the most frequently cited learning style instruments in research examining adult learners”  
(Rule & Grippin, 1988, p. 3).

Figure 2

Experiential Learning Cycle and Learning Styles



Source: Kolb, *Experiential Learning: Experience as The Source of Learning and Development*, 1984, p. 42.

Kolb (1995) believed that people were thought to learn through experience, and the process is conceived as a four-stage cycle (See Figure 2). Initially, the learner has the immediate or concrete experience, which is the basis for observations and reflections. These observations and reflections are assimilated and distilled into a theory or concept from which new implications for action can be drawn. These implications can be tested and serve as guides in creating new experiences.

According to Kolb (1995), the Kolb Learning Style Inventory uses two scales to categorize individuals into four groups of learners. The first scale indicates how individuals seize information - primarily through Abstract Conceptualization (AC) or Concrete Experience (CE). The second scale indicates how individuals transform information - primarily through Reflective Observation (RO) or Active Experimentation (AE). These two scales produce two combination scores, AC-CE and AE-RO, that can be plotted on a grid to create four basic learning-style type quadrants. The quadrants illustrate four groups of learners that Kolb calls Accommodator (CE-AE), Diverger (CE-RO), Converger (AC-AE), and Assimilator (AC-RO) (Filbeck & Smith, 1996).

The four types are described by Kolb (1995) as follows: Accommodators: the distinguished merit of accommodators lies in doing things, carrying out new plans and experiments, and being involved in new experiences. Kolb suggested that accommodators come from technical and practical educational backgrounds such as business. Divergers: the most valuable strength of divergers lies in imaginative ability and ability to view concrete circumstances from numerous perspectives. Kolb suggests that divergers are interested in people. People with this characteristic are usually in the humanities and

liberal arts. Convergers: their merit is in the practical application of these ideas. Kolb suggested that convergers do best in conditions where there is only one correct answer to a problem. Many engineers have this characteristic. Assimilators: the greatest worth of assimilators is in the creation of theoretical models. They are more interested in abstract theories than in people, but less concerned with the practical usefulness of theories. Kolb suggested that assimilators are more often found as planners or as researchers.

Kolb's model of learning is an adaptive process, and his view of learning styles as differences in preferred modes can be helpful in studying the academic performance of the student. This study employed Kolb's Learning Style Inventory to examine differences of learning style between the two groups who came from different post-secondary educational backgrounds in TOUC. The results of the LSI survey could support analysis of the causes of varied academic performance of the students in this study.

### Summary

The review of related literature on transfer of learning theory, continuity and articulation, academic skills, and learning styles establishes a conceptual framework for the present study comparing the academic performance of two different patterns of post-secondary high school graduates in business specialized courses at a college. From a theoretical perspective, transfer of learning theory provides an applicable concept for the study of student's learning effectiveness. When learners master the transfer skill, it is easy for them to apply previous knowledge learned to advanced levels or other fields.

Similarly, based on the curriculum development concept of continuity and articulation, a well-developed curriculum can help students be proficient in learning from level to level and also from field to field.

Academic skills are the instruments students need for school learning. This is the knowledge that students acquired from previous academic accomplishments. With adequate academic skills, students are able to deal with various problems or questions from school learning. Anyone who fails to master academic skills risks effective school learning. To ensure that students meet the required learning skills for higher education, most of the higher educational institutions establish entrance standards to screen their applicants. While the CLAST is one of the major instruments for evaluating students' academic skills in the United States, the education system in Taiwan has adopted the JCEE and the RSEE as the academic skill evaluating instrument for college applicants.

The learning style literature provides an understanding of the effect of learning style on students' learning effectiveness. Students have varied learning styles. The learning style differences influence student success in their particular major. While the teacher provides adequate instructional style for certain students according to their learning style, student's performance may be improved if there is more data about how to adapt instruction to meet student needs. This is particularly true when students came from different experiences and the knowledge base of their high school curriculum varies.

## CHAPTER THREE

### METHODOLOGY

#### Overview

The present study uses a causal-comparative research design to identify the influences of different post-secondary educational background on specialized course performance of college business majors. Data for this study were compiled from a longitudinal research database that stores demographic and academic data for students who enrolled at Tamsui Oxford University College as first-time-in-college students for the school year 1994 and 1995.

The students involved in this study were limited to the students of four departments in the TOUC; yet, the students must have completed financial management as well as certain courses related to financial management. Students were categorized into comparison groups based on their post-secondary educational background. Thus, groups were defined by the senior high school graduate and the commercial high school graduate. Some of the students might retake the same course more than once due to failure in their first-time class. Only first-time class performance was used for the analysis.

The analysis of this study began with the comparison of students' performance on lower level courses and, then, was followed by a comparison of students' performance in

financial management. The analysis also considered the relationship between the students' performance in financial management and its prerequisite courses. The applied statistical methods included t-test, correlation, and multiple regression. The statistical treatment of the data was performed with the Statistical Package for the Social Sciences (SPSS).

### Research Hypotheses

Based on the research question and the subsidiary questions in Chapter One, the following eleven null hypotheses were examined in this study.

Hypothesis 1. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on accounting (I) at TOUC.

Hypothesis 2. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on economics at TOUC.

Hypothesis 3. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on statistics at TOUC.

Hypothesis 4. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on Chinese at TOUC.

Hypothesis 5. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on English at TOUC.



Hypothesis 6. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on calculus at TOUC.

Hypothesis 7. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on history at TOUC.

Hypothesis 8. There are no academic performance differences between senior high school graduates and senior commercial high school graduates on the thought of Dr. Sun Yet-Sen at TOUC.

Hypothesis 9. There is no academic performance difference between senior high school graduates and senior commercial high school graduates on financial management at TOUC.

Hypothesis 10. There is no relationship between the students' academic performance in financial management and its related prerequisite courses at TOUC.

Hypothesis 11. There are no learning style differences between senior high school graduates and senior commercial high school graduates at TOUC.

### Selection of Subjects

The purpose of the this study was to identify the differences in academic performance in certain specialized business courses between two different post-secondary educational background groups. Thus, the selection of subjects for this study involved the use of specific data selection criteria applied to a cohort data base of students who entered Tamsui Oxford University College (TOUC) since the fall 1995 as first-time-in-college

freshmen. Thus, those transfer-students who graduated from junior college were not included in this study because they already completed most of the specialized courses while they were junior college students.

The selection criteria also limited the subjects to those full-time students who were in the day school section; the students in the night school section and part-time students were excluded in the research. The selection criteria excluded the part-time students because they had more opportunities to get the knowledge not only from the class but also as part of the on-site training of the company which employed them. Moreover, the students of the two-year institute of technology section of TOUC were not included in this study because they experienced a different curriculum design and instructional emphasis compared to that of the four-year academic college students.

The study was concerned with student performance in financial management and its prerequisite courses, accounting (I), economics, and statistics, only the students who completed those courses were selected from the pool of all eligible TOUC students. Therefore, only the students of the following departments were selected: the department of public finance and taxation, the department of accounting, the department of business administration, and the department of finance and banking.

Totally, according to the selection criteria, one hundred and fifty-eight students who entered the TOUC since 1995 as first-time-in-college freshmen in the four departments in the day school section comprised the entire sample of eligible subjects. Thirty-six senior commercial high school graduates and one hundred and twenty-two senior high school graduates were studied (See Table 4).

Table 4

Number of Selected Subjects

Department Background	PT	AC	BA	FB
CHSG	5	5	16	10
SHSG	31	22	47	22

Notes: Code for department and student's post-secondary educational background  
 PT = public finance and taxation, AC = accounting, FB = finance and banking,  
 BA = business administration.  
 CHSG = senior commercial high school graduated,  
 SHSG = senior high school graduated.  
 Source: Registration Office of the TOUC.

Instrumentation

The present study examined the students' academic performance differences in certain specialized business courses between the commercial high school graduates and the senior high school graduates at TOUC by collecting the related data for all the subjects in this study. The data were also used to examine the relationship between students' academic performance in financial management and certain of its related courses. Data were collected through analysis of student transcripts from official school records.

To analyze the differences of students' learning style between the commercial high school graduates and the senior high school graduates, the students in this study were administered Kolb's Learning Style Inventory (LSI). According to Biberman and Buchanan (1986), Kolb's LSI is the instrument which management researchers and

faculty are most familiar with for measuring learning style. In his review of the learning style inventory, Gregg (1985) stated that “the LSI is a promising measurement. It is a quick and reliable self-report instrument measuring learning style” (p. 442). Also, the Learning Style Inventory has been claimed to retain validity across cultural lines (Katz, 1988).

The questions in the LSI survey were translated into a Chinese version and were approved by the professor of the department of foreign language and literature of TOUC. The demographic data and academic scores pertaining to the subjects in this research were obtained from official documents, therefore the reliability of these documents was considered relatively accurate.

### Research Design

The research design for the present study was causal-comparative research. Since the principal purpose of the study was to determine whether there were significant differences in certain student’s course performance which could be ascribed to the student’s post-secondary educational background, the subjects for the study were assigned ex post facto to one of two groups: the senior high school graduated group and the senior commercial high school graduated group. Assignment to any one of these groups was based upon the student’s post-secondary educational background. Therefore, the student’s post-secondary educational background was applied as the primary independent variable in the study.

The dependent variables for this study were the students' related course scores in economics, accounting (I), statistics, financial management, Chinese, English, calculus, and history. Hence, the design involved an analysis of variance among and between the two groups to determine whether there were statistically significant differences associated with the independent variable, the student's post-secondary educational background.

### Procedures

According to the demographic data provided by the office of the Academic Affairs at TOUC, the students involved in this study were limited to the students of the department of public finance and taxation, the department of accounting, the department of business administration, and the department of finance and banking in the day school section. During the early weeks of July in 1998, the data on subjects were provided by the office of the Academic Affairs at TOUC (in Taiwan, the ending of the school year is at the end of June). In order to keep student's privacy, all data were provided with anonymity and came with the assigned number. Only the score of the first-time course performance was utilized for the analysis.

The LSI survey to the students was administered in the class for seniors of the department of public finance and taxation, the department of accounting, the department of business administration, and the department of finance and banking. During the fall of 1998, 158 seniors of the four departments at TOUC were selected for the survey. With

the permission of the class instructor, the researcher used the first twenty minutes or the last twenty minutes of the class for the survey processing.

### Statistical Operations

The data used in this study were retrieved from a mainframe computer data base at Tamsui Oxford University College. The data were analyzed by using the Statistical Package for the Social Sciences (SPSS). In order to examine the research questions and hypotheses, t-tests were performed for student's accounting (I) scores, economics scores, statistics scores, financial management scores, Chinese scores, English scores, calculus scores, and history scores by selected independent variables: senior high school graduates and commercial high school graduates at TOUC. Crosstabs was performed in order to examine the difference in learning style between the commercial high school graduates and the senior high school graduates at TOUC.

## CHAPTER FOUR

### ANALYSIS OF DATA

#### Introduction

This chapter organizes the presentation and analysis of the collected data into two sections. The first part, the comparisons of the students' academic performance, presents and analyzes data relating to the research hypotheses on the students' academic performance. The second part, the survey of students' learning style, provides a description of the learning styles of the students who completed the survey. The results of the questions relating to the hypotheses on students' learning style are presented in this section.

Data of student's academic performance were collected in the fall of 1998 from official records of TOUC in Taiwan. The scores of nine courses were collected for each student in this research study. Four of the scores represent specialized courses including: accounting (I), economics, statistics, and financial management; and, five were scores of general courses including: Chinese, English, calculus, history, and Thought of Dr. Sun Yet-Sen. The student's academic scores were provided by the Academic Department and Computer Center of the TOUC. In order to analyze the students' learning styles that may influence student's academic performance, Kolb's Learning Style Inventory, a questionnaire consisting of 12 questions, was administered to the subject students in the fall of 1998.

## Information from the Students' Academic Performance

The data were obtained from official student's academic records. The main purpose of this study was to determine whether there were academic performance differences in financial management and its related prerequisite courses between the senior commercial high school graduates and the senior high school graduates at the TOUC. To answer the overall research question and related research hypotheses in Chapter 1, the independent samples t-test was applied to determine if there was a significant difference between the academic performance of the two groups in this study. The multiple correlation technique was applied to analyze the correlation coefficient of the studied variables, student's academic performance on financial management and its related prerequisite courses, and to determine the level of significance.

### Hypothesis Tests

The independent-sample t-tests were performed comparing the mean scores of each course for the commercial high school graduates and the senior high school graduates. Before the results of each t-test were applied, the results of the Levene tests were checked to see if the assumption of equal variances had been violated. The results of the tests of significance for hypotheses 1 through 9 are presented below.

Hypothesis 1: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in accounting (I) at TOUC.



Table 5

T-Test Results for Student's Academic Performance in Accounting (I)

Variable	N	Mean	SD	t	p
Performance in ACCO				5.701	<.0005**
CHSG	36	81.51	11.86		
SHSG	122	67.20	13.60		

Note: \*\*p < .01; ACCO = accounting (I), CHSG = commercial high school graduates, SHSG = senior high school graduates.

Table 5 shows a significant difference in accounting (I) between the senior commercial high school graduates and senior high school graduates,  $t = 5.70$ ,  $df = 156$ ,  $p < .0005$ . The null hypothesis is rejected. The mean accounting (I) score for commercial high school graduates was 81.51, significantly higher than senior high school graduates' 67.20.

Hypothesis 2: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in economics at TOUC.

Table 6

T-Test Results for Student's Academic Performance in Economics

Variable	N	Mean	SD	t	p
Performance in ECON				3.581	<.0005**
CHSG	36	77.40	8.95		
SHSG	122	72.05	7.54		

Note: \*\*p < .01; ECON = economics, CHSG = commercial high school graduates, SHSG = senior high school graduates.

T test indicated there was a significant difference between the senior commercial high school graduates and senior high school graduates in economics,  $t = 3.58$ ,  $df = 156$ ,  $p < .0005$  (See Table 6). The null hypothesis is rejected. The mean scores of economics for commercial high school graduates ( $M = 77.40$ ) was higher than that for senior high school graduates ( $M = 72.50$ ).

Hypothesis 3: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in statistics at TOUC.

Table 7

T-Test Results for Student's Academic Performance in Statistics

Variable	N	Mean	SD	t	p
Performance in STAT				.379	.705
CHSG	36	63.28	12.15		
SHSG	122	62.38	12.55		

Note: \* $p \geq .05$ ; STAT= statistics, CHSG = commercial high school graduates, SHSG = senior high school graduates.

As can be seen from the data in Table 7, the t test indicated there was no significant difference between the senior commercial high school graduates and senior high school graduates in statistics ( $t = .379$ ,  $df = 156$ ,  $p < .705$ ). The null hypothesis is not rejected. The mean statistics scores for two groups were about the same, 63.28 for the senior commercial high school graduates and 62.38 for the senior high school graduates.

Hypothesis 4: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in financial management at TOUC.

Table 8

T-Test Results for Student's Academic Performance in Financial Management

Variable	N	Mean	SD	t	p
Performance in FINA				2.139	.034*
CHSG	36	73.13	8.95		
SHSG	119	68.96	10.58		

Note: \* $p < .05$ ; FINA = financial management, CHSG = commercial high school graduates. SHSG = senior high school graduates.

Table 8, results of the two-tailed test showed a significant difference in financial management between commercial high school graduates and senior high school graduates ( $t = 2.139$ ,  $df = 143$ ,  $p < .034$ ). The null hypothesis is rejected. The mean scores of financial management for commercial high school graduates ( $M = 73.13$ ) was higher than that for senior high school graduates ( $M = 68.96$ ). The mean difference in financial management score was 4.17.

Hypothesis 5: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in Chinese at TOUC.

Table 9

T-Test Results for Student's Academic Performance in Chinese

Variable	N	Mean	SD	t	p
Performance in CHIN				.173	.863
CHSG	34	72.35	5.95		
SHSG	116	72.16	5.83		

Note: \* $p \geq .05$ ; CHIN = Chinese, CHSG = commercial high school graduates, SHSG = senior high school graduates.

According to Table 9,  $t = .173$ ,  $df = 148$ ,  $p < .863$ , indicated that there was no significant difference in mean scores of Chinese between commercial high school graduates and senior high school graduates. The null hypothesis is not rejected. The mean score of Chinese for commercial high school graduates was 72.35 and for senior high school graduates was 72.15. The mean scores difference in Chinese was only .20.

Hypothesis 6: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in English at TOUC.

Table 10

T-Test Results for Student's Academic Performance in English

Variable	N	Mean	SD	t	p
Performance in ENGL				-.404	.688
CHSG	35	69.74	15.15		
SHSG	116	70.87	11.74		

Note: \* $p \geq .05$ ; ENGL = English. CHSG = commercial high school graduates. SHSG = senior high school graduates.

Table 11

Levene's Test for Student's Academic Performance in English

	Levene's test for equality of variances		T test for equality of means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	4.194	.042	-.463	149	.644
Equal variances not assumed			-.404	46.981	.688

The results of the Levene test indicated the assumption of equal variances was violated,  $F = 4.194$  with an associated probability of .042 (See Table 11). Table 10 shows that there was no significant difference in mean scores of English between commercial high school graduates and senior high school graduates,  $t = -.404$ ,  $df = 149$ ,  $p < .688$ . The

null hypothesis was not rejected. The mean score for commercial high school graduates was 69.74 and for senior high school graduates was 70.87.

Hypothesis 7: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in calculus at TOUC.

Table 12

T-Test Results for Student's Academic Performance in Calculus

Variable	N	Mean	SD	t	p
Performance in CALC				-.079	.937
CHSG	36	62.67	13.97		
SHSG	122	62.85	11.83		

Note: \* $p \geq .05$ ; CALC = calculus, CHSG = commercial high school graduates, SHSG = senior high school graduates.

Referring to Table 12,  $t = -.079$ ,  $df = 156$ ,  $p < .937$ , indicated that there was no significant difference in mean scores of calculus between commercial high school graduates and senior high school graduates. The null hypothesis is not rejected. The mean scores of calculus for commercial high school graduates was 62.67 and for senior high school graduates was 62.85.

Hypothesis 8: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in history at TOUC.

Table 13

T-Test Results for Student's Academic Performance in History

Variable	N	Mean	SD	t	p
Performance in HIST				.078	.938
CHSG	36	76.63	9.65		
SHSG	121	76.50	8.05		

Note: \* $p \geq .05$ ; HIST = history, CHSG = commercial high school graduates, SHSG = senior high school graduates.

As shown in Table 13,  $t = .078$ ,  $df = 155$ ,  $p < .938$ , there was no significant difference in mean scores of history between commercial high school graduates and senior high school graduates. The null hypothesis is not rejected. The mean score of history for commercial high school graduates was 76.63 and for senior high school graduates was 76.50. The mean score difference in history was only .13.



Hypothesis 9: There is no academic performance difference between senior high school graduates and senior commercial high school graduates in thoughts of Dr. Sun-Yet Sen at TOUC.

Table 14

T-Test Results for Student's Academic Performance in Thoughts of Dr. Sun-Yet Sen

Variable	N	Mean	SD	t	p
Performance in THOU				1.320	.193
CHSG	35	79.66	7.07		
SHSG	120	77.92	6.17		

Note: \* $p \geq .05$ ; THOU = Thoughts of Dr. Sun-Yet Sen, CHSG = commercial high school graduates, SHSG = senior high school graduates.

Table 15

Levene's Test for Student's Academic Performance in Thoughts of Dr. Sun-Yet Sen

	Levene's test for equality of variances		T test for equality of means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	4.003	.047	1.429	153	.155
Equal variances not assumed			1.320	49.802	.193

The results of the Levene test indicated the assumption of equal variances was violated,  $F = 4.003$  with an associated probability of .047 (See Table 15). Table 14 shows that there was no significant difference in mean scores of Thoughts of Dr. Sun-Yet Sen between commercial high school graduates and senior high school graduates,  $t = 1.32$ ,  $df$

= 49.802,  $p < .193$ . The null hypothesis is not rejected. The mean score for commercial high school graduates was 79.66 and for senior high school graduates was 77.92.

Hypothesis 10: There is no relationship between the students' academic performance in financial management and its related prerequisite courses at TOUC.

A multiple regression analysis was carried out in this study to measure the strength of the association between student's academic performance in financial management and its related prerequisite courses, accounting (I), economics, and statistics. The results of the test can be used to support analyzing the relationship between the students' academic performance in financial management and their secondary education background. Concerning the variables in the test, the student's scores for financial management is the dependent variable, and their scores in accounting (I), economics, and statistics are independent variables.

Table 16 shows the multiple correlation coefficient  $R = .398$ ,  $F = 9.468$ ,  $p < .0005$ , which indicated that there was a significant relationship that could predict student's financial management performance based on the accounting (I) score, the economics score, and the statistics score.

Approximately 16 % of the variance in the students' financial management performance could be explained by the independent variables, the accounting (I) score, the economics score, and the statistics score ( $R^2 = .158$ ).

The estimated linear regression model is:  $FINA = 38.00 + (.103)*(ACCO) + (.204)*(ECON) + (.155)*(STAT)$ . The score of statistics is the only significant predictor ( $p = .027$ ) of students' financial management performance at TOUC.

Table 16

Results of Multiple Correlation Coefficient Test

Dependent Variable					
<u>Variable</u>	<u>Multiple R</u>	<u>R Square</u>	<u>F Value</u>	<u>Sig. F</u>	
FINA	.398	.158	9.468	.0005*	

Independent Variables					
<u>Variables</u>	<u>B</u>	<u>SE B</u>	<u>Beta</u>	<u>T</u>	<u>Sig. T</u>
(Constant)	38.002	7.258		5.235	.000**
ACCO	.103	.068	.146	1.498	.136
ECON	.204	.129	.159	1.585	.115
STAT	.155	.069	.187	2.228	.027*

Notes: \* $p < .01$ ;  
 FINA = financial management, ACCO = accounting (I), ECON = economics,  
 STAT = statistics.

The Survey of Students' Learning Styles

In order to analyze the learning styles of subject students at TOUC in this study, 1993 version of Kolb's Learning Style Inventory 1985 (LSI 1985) was used. The test is a

12-item questionnaire in which respondents attempt to describe their learning style. The results of LSI survey may support identification of the attribute of learning style for each subject. The results, then, may also be used to explain the academic performance difference between commercial high school graduates and senior high school graduates at TOUC.

Learning Styles of Overall Respondents

Totally, out of 127 questionnaires, 80.38% were returned with completed and usable data. Thirty-five (27.56%) of the respondents were commercial high school graduates; ninety-two (72.44%) of the respondents were senior high school graduates. The respondents' learning styles were identified by using Kolb's Learning Style Inventory. Among the subject students, as shown in Table 17, eighteen were classified as converger (14.17%), forty were classified as diverger (31.50%), forty were classified as assimilator (31.50%), and twenty-nine were classified as accommodator (22.83%).

Table 17

Summary of Learning Styles Preference by Secondary Education Background

Learning Style	Group				Total	
	CHSG		SHSG			
Converger	6	17.14%	12	13.04%	18	14.17%
Diverger	13	37.14%	27	29.35%	40	31.50%
Assimilator	8	22.86%	32	34.78%	40	31.50%
Accommodator	8	22.86%	21	22.83%	29	22.83%
Total	35	100%	92	100%	127	100%

Notes: CHSG = commercial high school graduates, SHSG = senior high school graduates.

### Learning Style in the Two Different Groups

About 60% of commercial high school graduates tend to be either divergers (37.14%) or accommodators (22.86%), that is, they prefer learning from feeling; they learn from specific experiences; they relate to people and are sensitive to people's feelings. For these 60% commercial high school graduates, the majority, divergers, tend to learn by watching and listening. They carefully observe before making judgements, and they view issues from different perspectives and look for meaning in situations. Accommodators tend to learn by doing; they have the ability to get things done: they are risk takers; and, they influence people and events through action.

In contrast, 40% of the commercial high school graduates respondents prefer to learn by thinking. They tend to be either convergers (17.14%) or assimilators (22.86%). They analyze ideas logically; they plan systematically. Their actions rely on an intellectual understanding of a situation. While assimilators tend to learn by watching and listening, convergers tend to learn by doing.

Over 52% of senior high school graduate respondents were either divergers (29.35%) or accommodators (22.83%). The rest of them were either assimilators (34.78%) or convergers (13.04%). As can be seen from Table 17, convergers were the minority in both groups; divergers were the majority of the commercial high school graduate group; and, assimilators were the majority of the senior high school graduate group.

### Results of the Test of Hypothesis

A crosstabs analysis was conducted to examine the relationship between the students' learning style preferences and their secondary education background. A chi-square test of independence was carried out to test the final hypothesis.

Hypothesis 11: There are no learning style differences between senior high school graduates and senior commercial high school graduates at TOUC.

Table 18

#### Learning Styles Preference by Secondary Education Background Crosstabulation

Learning Style	CHSG	SHSG	Total
Converger	6	12	18
Diverger	13	27	40
Assimilator	8	32	40
Accommodator	8	21	29
Total	35	92	127

Notes: The significance of the Chi-Square test was  $\chi^2 = 1.94$ ,  $df = 3$ ,  $p < .586$ .  
CHSG = commercial high school graduates, SHSG = senior high school graduates.

Table 18 shows that the number of the students' learning styles preference by their secondary educational background. The computed Pearson chi-square statistic for this table is 1.935 with  $df = 3$  and has an associated probability,  $p = .586$ . Therefore, the

hypothesis of independence failed to be rejected. Results of this test indicated that there was no significant difference in learning styles between senior high school graduates and senior commercial high school graduates at TOUC.

### Summary

This chapter presented the findings of the analysis procedures on the collected data from official student records and the Kolb's LSI questionnaire that was administered to students. The analysis procedures were described and results of the findings were presented in Table 5 through Table 18. Eleven hypotheses generated in Chapter Three were tested and analyzed.

Based on analyses of data, this study found there were significant differences between commercial high school graduates and senior high school graduates on academic performance in accounting (I), economics, and financial management. There were no significant differences between commercial high school graduates and senior high school graduates on academic performance in statistics, Chinese, English, calculus, history and the Thoughts of Dr. Sun-Yet Sen.

The results of this study indicated there was a significant relationship that could predict student's financial management academic performance based on the economics score, the accounting (I) score, and the statistics score. There were no significant differences between commercial high school graduates and senior high school graduates in their learning styles.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

##### Purpose

In Taiwan, there are three different patterns of post-secondary education institutions offered due to the government's education policy for the needs of country's economic development. Since most of the freshmen of TOUC come from senior commercial high schools and senior high schools, there may exist differences in academic knowledge, academic skills, and learning styles between the two groups at the beginning of their freshman year. The different post-secondary education curricula were arranged for senior commercial high school and senior high school students, but, the instructors at TOUC were concerned about student's learning effectiveness in certain courses at college.

The purpose of this study was to examine whether there were academic performance differences in financial management and related prerequisite courses between the senior commercial high school graduates and senior high school graduates at TOUC. The results of this study could be used to provide instructors with information concerning whether the existing differences of post-secondary curriculum influence the learning effectiveness of the two groups in certain business courses at college. Further,



the results of this study could be helpful for future research on curriculum development for post-secondary education or teaching method design for higher education in TOUC.

### The Research Question

This study used statistical methodology to compare senior commercial high school graduates and senior high school graduates on their academic performance in financial management and its related prerequisite courses taken at Tamsui Oxford University College in Taiwan. The research question was: To what extent is the academic performance of the students at TOUC in financial management class as well as its prerequisite courses attributable to the students' different educational background in post-secondary school?

### Subsidiary Questions

Five subsidiary questions under investigation were:

- (1). Are there academic performance differences between senior high school graduates and senior commercial high school graduates on the prerequisite courses that relate to financial management at TOUC?
- (2). Are there academic performance differences between senior high school graduates and senior commercial high school graduates in the general courses at TOUC?
- (3). Are there academic performance differences between senior high school graduates and senior commercial high school graduates in financial management class at TOUC?

(4). Is there a relationship between the students' performance in prerequisite courses that relate to financial management and their performance in the financial management at TOUC?

(5). Are there learning style differences between senior high school graduates and senior commercial high school graduates at TOUC?

### Methodology

This study required a causal-comparative research design to investigate the influence of different post-secondary educational background on specialized course performance of college business majors. The subject students for this study were selected from a population of students who took financial management at TOUC in Taiwan. Students were assigned to comparison groups in accordance with their post-secondary educational background. One hundred and fifty-eight students who entered the TOUC since 1995 as first-time-in-college freshmen in four departments of the TOUC were selected as research subjects.

In order to examine students' academic performance differences in certain courses between the two groups, student transcripts were collected from official school records. The subjects were administered Kolb's LSI survey to analyze their learning style. Data from the subjects were tabulated and analyzed by using the Statistical Package for the Social Sciences (SPSS). In order to test the research questions and hypotheses, t-tests were performed for determining the differences of academic performance in accounting (I), economics, statistics, financial management, Chinese, English, calculus, history, and

the Thoughts of Dr. Sun-Yet Sen between commercial high school graduates and senior high school graduates at TOUC. The multiple correlation technique was performed to analyze the correlation coefficient of the studied variables, student's academic performance on financial management and its related prerequisite courses, and determined the level of significance. Crosstabs were performed to examine the difference in learning style between commercial high school graduates and senior high school graduates at TOUC.

### Findings

This study attempted to find out to what extent the academic performance of the students at TOUC in a financial management class as well as its prerequisite courses were attributable to the students' different educational background in post-secondary school. Based on the statistical analysis in Chapter Four, the following findings of hypotheses that related to the subsidiary questions have been reached:

Subsidiary Question 1: Are there academic performance differences between senior high school graduates and senior commercial high school graduates on the prerequisite courses that relate to financial management at TOUC?

The first null hypothesis was tested and the findings supported the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in accounting (I).

The second null hypothesis was tested and the findings supported the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in economics.

The third null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in statistics.

Subsidiary Question 2: Are there academic performance differences between senior high school graduates and senior commercial high school graduates in the general courses at TOUC?

The fifth null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in Chinese.

The sixth null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in English.

The seventh null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between

commercial high school graduates and senior high school graduates on the academic performance in calculus.

The eighth null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in history.

The ninth null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in the thoughts of Dr. Sun-Yet Sen.

Subsidiary Question 3: Are there academic performance differences between senior high school graduates and senior commercial high school graduates in the financial management class at TOUC?

The fourth null hypothesis was tested and the findings support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance in financial management.

Subsidiary Question 4: Was there a relationship between the students' performance in prerequisite courses that relate to financial management and their performance in the financial management at TOUC?

The tenth null hypothesis was tested, and the multiple correlation coefficient indicated that there was a significant relationship that could predict student's financial

management performance based on the accounting (I) score, the economics score, and the statistics score.

Subsidiary Question 5: Are learning style differences existing between senior high school graduates and senior commercial high school graduates at TOUC?

The eleventh null hypothesis was tested and the findings failed to support the rejection of the null hypothesis that there would be no significant differences between commercial high school graduates and senior high school graduates on the academic performance on their learning styles at TOUC.

### Interpretation of Findings

In this study, students' academic performance in three specialized courses, accounting (I), economics, and financial management, were found to be of significant difference between senior high school graduates and commercial high school graduates. These findings are related to the different curriculum arrangement for senior high school and commercial high school students (See Table 1 and Table 2). That is, due to previously learned knowledge from business-related courses in post-secondary high school, commercial high school graduates' academic performance in these three specialized courses were significantly higher than that of senior high school graduates. However, even though senior high school graduates did not take statistics class during their senior high school years, their lack of preparation was remediated by their solid preparation for JCEE in mathematics. Therefore, the academic performance in statistics between the two groups was about the same.

Though credit hour arrangement in general courses for senior high school students and commercial high school students were different, the academic performance in all of five general courses in this study was tested to be equivalent. The findings in this study implied that students' academic performance in general courses would not be influenced by the credit hour arrangement for post-secondary high school students.

The relationship between students' academic performance in financial management and its prerequisite courses, accounting (I), economics, and statistics at TOUC was confirmed. There was a positive correlation between the students' academic performance in financial management and its related prerequisite courses accounting (I), economics, and statistics. In short, a student who had a high score in accounting (I), economics, and statistics tended to perform well in his or her financial management at TOUC.

There was no significant difference in students' learning styles preference between commercial high school graduates and senior high school graduates at TOUC. The findings in this study implied that the different post-secondary high school background of students did not influence their learning style preference.

### Conclusions

The results of this study lead to a number of conclusions on the difference of post-secondary educational background that could influence business majors' academic performance in certain specialized courses at the TOUC in Taiwan.

In this study, there was no significant difference in learning styles between the senior high school graduates and the commercial high school graduates in the department of public finance and taxation, the department of accounting, the department of business administration, and the department of finance and banking of TOUC. The results indicated that student's learning styles were not different based on their previous educational background. The results implied that student's learning style was not the factor that caused the differences in students' academic performance.

Since the senior high school graduates never took accounting, economics and financial management class during their secondary educational years, their academic performance in accounting (I), economics and financial management was significantly lower than that of the commercial high school graduates who had completed accounting and economics classes during their secondary education years.

While there was no significant difference in learning styles between the two groups, the differences in their academic performance in accounting (I), economics, and financial management can be attributed to the different curriculum arrangement of their secondary education. Yet, there was significant relationship between academic performance in financial management and its related courses, accounting (I), economics, and statistics. The commercial high school graduates' academic performance in accounting (I) and economics was higher than that of the senior high school graduates, and this may have contributed to the commercial high school graduates having higher academic performance in financial management than that of the senior high school graduates in this study.



Grounded in their solid study in mathematics preparation for JCEE, even though the high school graduates did not have statistics class during their senior high school years, their academic performance in statistics was not significantly different than that of the commercial high school graduates who had completed a statistics class during their secondary education years. Therefore, they both were prepared to perform well in this course.

There were no significant differences on academic performances between the commercial high school graduates and the senior high school graduates in general courses, i.e., Chinese, English, calculus, history, and the Thoughts of Dr. Sun-Yet Sen. The results indicated that the students' secondary education background did not influence their academic performances in general courses, even though there were different curriculum arrangements for general courses for commercial high school and senior high school in Taiwan. On the other hand, students' academic performance in certain specialized courses were influenced by their secondary education background.

Transfer of learning theory provides an applicable concept for the study of student's learning effectiveness. When learners master the transfer skill, it is easy for them to apply previously acquired knowledge to advanced levels or other fields. The findings of this study implied that the students who possesses a certain knowledge or skill can transfer or apply to a certain extent in advanced learning or other fields. Similarly, based on the curriculum development concept of continuity and articulation, a well-developed curriculum can help students be proficient in learning from level to level and also from field to field. Comparing the curriculum of the senior high schools and that of

the commercial high schools in Taiwan, the curriculum of the commercial high schools was more related to the business field they subsequently experienced in college.

Therefore, the commercial high school graduates were able to transfer more knowledge of the business field they learned in their post-secondary education years to business courses at the TOUC. Thus, their academic performance in certain business classes was higher than that of the senior high school graduates in this study.

### Recommendations

The conclusions drawn from this study serve as the basis for several recommendations, both for educational practice and for future research.

The following recommendations are made for educational practice as it relates to financial management and business programs at the college level:

1. It is recommended that the current curriculum for senior high schools in Taiwan needs to be reformed. General business education and technical vocational education should be included in the curriculum of all patterns of post-secondary schools. The senior high schools should provide diversified curriculum that focuses not only on students' academic needs for advanced study, but also preparation for the labor market.

2. Commercial high school graduates, the minority in the class, should not be ignored while instructors pay more attention to senior high school graduates who were the majority in the class and the novices in the course; otherwise, the commercial high school graduates might feel bored or unchallenging during the class. The commercial

high school graduates should be assigned different homework from that for the senior high school graduates; yet, the content of the homework should be sufficiently complicated, not only to meet their learning background but also to attract their interest. Case study or business news review, for example, could help commercial high school graduates feel more challenged while learning at the college level.

3. To reinforce student's learning effectiveness, the adoption of group study should be encouraged. An appropriate leader or tutor for each group could be selected among the commercial high school graduates. The leader of the study group could lead the senior high school graduates in the unfamiliar field into a more comfortable learning circumstance and guide them to grasp essential points in order to learn the new material.

4. To help students transfer their previously learned knowledge and skills from post-secondary school into college, there are several guidelines that can be used by college instructors: Construct a model that captures the essence of what it is that needs to be learned and, then, give students a wide variety of examples; make the learning situation as much as like the real-world situation as possible; provide lots of practice on the original task and on related tasks.

The following recommendations are offered for future study:

1. Other similar studies should be conducted to investigate the effect of students' post-secondary educational background on their academic performance in other business courses at the TOUC.

2. Similar research should be conducted in various four-year colleges, universities, and colleges of technology to determine whether the results are generalizable to other populations.

3. A quantitative analysis that compares students' academic performance in business courses as it relates to learning styles could be a valuable direction for future research.

4. A study should be conducted to determine whether commercial programs prepare students for other fields than business better than senior high schools.

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**Appendix A**  
**Statistic Output**

# T-Test (Accounting I)

## Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	36	81.5139	11.8620	1.9770
	SHSG	122	67.2049	13.6036	1.2316

## Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	136	.713	5.701	156	.000	14.3090	2.5099	9.3513	19.2667
	Equal variances not assumed			6.143	64.622	.000	14.3090	2.3292	9.6566	18.9613

## T-Test (Economics)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	36	77.4028	8.9481	1.4914
	SHSG	122	72.0533	7.5386	.6825

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	3.306	.071	3.581	156	.000	5.3495	1.4940	2.3984	8.3005
	Equal variances not assumed			3.262	50.554	.002	5.3495	1.6401	2.0561	8.6429

## T-Test (Statistics)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	36	63.2778	12.1487	2.0248
	SHSG	122	62.3811	12.5547	1.1366

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	.054	.816	.379	156	.705	.8966	2.3642	-3.7733	5.5666
	Equal variances not assumed			.386	58.845	.701	.8966	2.3220	-3.7500	5.5432

## T-Test (Financial Management)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	36	73.1250	8.9470	1.4912
	SHSG	119	68.9622	10.5834	.9702

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	2.988	.086	2.139	153	.034	4.1628	1.9463	.3177	8.0079
	Equal variances not assumed			2.340	67.325	.022	4.1628	1.7790	.6122	7.7134

## T-Test (Chinese)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	34	72.3529	5.9538	1.0211
	SHSG	116	72.1552	5.8337	.5416

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	.021	.884	.173	148	.863	.1978	1.1429	-2.0608	2.4564
	Equal variances not assumed			.171	52.982	.865	.1978	1.1558	-2.1206	2.5161

## T-Test (English)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	35	69.7429	15.1451	2.5600
	SHSG	116	70.8664	11.7363	1.0897

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	4.194	.042	-.463	149	.644	-1.1235	2.4291	-5.9235	3.6764
	Equal variances not assumed			-.404	46.981	.688	-1.1235	2.7823	-6.7208	4.4737

## T-Test (Calculus)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	36	62.6667	13.9694	2.3282
	SHSG	122	62.8525	11.8342	1.0714

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	3.464	.065	-.079	156	.937	-.1858	2.3415	-4.8110	4.4394
	Equal variances not assumed			-.072	50.736	.942	-.1858	2.5629	-5.3317	4.9601



## T-Test (History)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	36	76.6250	9.6506	1.6084
	SHSG	121	76.5000	8.0457	.7314

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
								Lower		Upper
SCORE	Equal variances assumed	.055	.816	.078	155	.938	.1250	1.6013	-3.0383	3.2883
	Equal variances not assumed			.071	50.344	.944	.1250	1.7669	-3.4234	3.6734

## T-Test (Thoughts of Dr. Sun-Yet Sen)

### Group Statistics

	GROUP	N	Mean	Std. Deviation	Std. Error Mean
SCORE	CHSG	35	79.6571	7.0656	1.1943
	SHSG	120	77.9167	6.1156	.5583

### Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Mean	
									Lower	Upper
SCORE	Equal variances assumed	4.003	.047	1.429	153	.155	1.7405	1.2178	-.6653	4.1463
	Equal variances not assumed			1.320	49.802	.193	1.7405	1.3183	-.9078	4.3887

## Regression (Acc., Eco., & Sta. VS. Fin.)

Variables Entered/Removed<sup>P</sup>

Model	Variables Entered	Variables Removed	Method
1	STAT, ACCT, <sup>a</sup> ECON <sup>a</sup>	.	Enter

a. All requested variables entered.

b. Dependent Variable: FINA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.398 <sup>a</sup>	.158	.142	9.5895

a. Predictors: (Constant), STAT, ACCT, ECON

ANOVA<sup>P</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2611.892	3	870.631	9.468	.000 <sup>a</sup>
	Residual	13885.827	151	91.959		
	Total	16497.719	154			

a. Predictors: (Constant), STAT, ACCT, ECON

b. Dependent Variable: FINA

Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	38.002	7.258		5.235	.000
	ACCT	.103	.068	.146	1.498	.136
	ECON	.204	.129	.159	1.585	.115
	STAT	.155	.069	.187	2.228	.027

a. Dependent Variable: FINA

# Frequencies

## DEPT

Frequency Table

LEARNING STYLE			Frequency	Percent	Valid Percent	Cumulative Percent
COVERGER	Valid	PT	5	27.8	27.8	27.8
		AC	2	11.1	11.1	38.9
		BA	8	44.4	44.4	83.3
		FB	3	16.7	16.7	100.0
		Total	18	100.0	100.0	
	Total	18	100.0			
DIVERGER	Valid	PT	13	32.5	32.5	32.5
		AC	4	10.0	10.0	42.5
		BA	14	35.0	35.0	77.5
		FB	9	22.5	22.5	100.0
		Total	40	100.0	100.0	
	Total	40	100.0			
ASSIMILATOR	Valid	PT	10	25.0	25.0	25.0
		AC	8	20.0	20.0	45.0
		BA	7	17.5	17.5	62.5
		FB	15	37.5	37.5	100.0
		Total	40	100.0	100.0	
	Total	40	100.0			
ACCOMMODATOR	Valid	PT	4	13.8	13.8	13.8
		AC	7	24.1	24.1	37.9
		BA	12	41.4	41.4	79.3
		FB	6	20.7	20.7	100.0
		Total	29	100.0	100.0	
	Total	29	100.0			

## GENDER

Frequency Table

LEARNING STYLE			Frequency	Percent	Valid Percent	Cumulative Percent
COVERGER	Valid	FEMALE	11	61.1	61.1	61.1
		MALE	7	38.9	38.9	100.0
		Total	18	100.0	100.0	
	Total	18	100.0			
DIVERGER	Valid	FEMALE	30	75.0	75.0	75.0
		MALE	10	25.0	25.0	100.0
		Total	40	100.0	100.0	
	Total	40	100.0			
ASSIMILATOR	Valid	FEMALE	19	47.5	47.5	47.5
		MALE	21	52.5	52.5	100.0
		Total	40	100.0	100.0	
	Total	40	100.0			
ACCOMMODATOR	Valid	FEMALE	17	58.6	58.6	58.6
		MALE	12	41.4	41.4	100.0
		Total	29	100.0	100.0	
	Total	29	100.0			

## BACKGROUND

Frequency Table

LEARNING STYLE			Frequency	Percent	Valid Percent	Cumulative Percent
COVERGER	Valid	CHSG	6	33.3	33.3	33.3
		SHSG	12	66.7	66.7	100.0
		Total	18	100.0	100.0	
	Total	18	100.0			
DIVERGER	Valid	CHSG	13	32.5	32.5	32.5
		SHSG	27	67.5	67.5	100.0
		Total	40	100.0	100.0	
	Total	40	100.0			
ASSIMILATOR	Valid	CHSG	8	20.0	20.0	20.0
		SHSG	32	80.0	80.0	100.0
		Total	40	100.0	100.0	
	Total	40	100.0			
ACCOMMODATOR	Valid	CHSG	8	27.6	27.6	27.6
		SHSG	21	72.4	72.4	100.0
		Total	29	100.0	100.0	
	Total	29	100.0			

## Crosstabs

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Learning Style * Group	127	100.0%	0	.0%	127	100.0%

### Learning Style \* Group Crosstabulation

Count

		Group		Total
		CHSG	SHSG	
Learning Style	CONVERGER	6	12	18
	DIVERGER	13	27	40
	ASSIMILATOR	8	32	40
	ACCOMMODATOR	8	21	29
Total		35	92	127

### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.935 <sup>a</sup>	3	.586
Likelihood Ratio	1.985	3	.576
Linear-by-Linear Association	.659	1	.417
N of Valid Cases	127		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.96.

**Appendix B**  
**Survey Documents**

10 November 1998

Biing Shyun Lin  
1441 SW 104 Passage  
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Miami, FL 33174

Dear Mr. Lin:

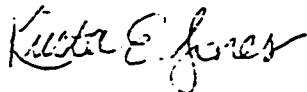
You may have permission to use the Learning Style Inventory for your research. I am sending a copy of the Chinese translation with this letter and you may have permission to make 158 copies of this for research purposes. Please make sure the copyright is visible on your copies.

You may also have permission to include copies of both the English and Chinese versions of the Learning Style Inventory in your dissertation. However, these copies *may not* be included in any electronic or microfilmed reproductions of the dissertation. Please replace the inventories with a page listing our contact information.

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Thanks very much and good luck with your research.

Regards,



Krista Jones  
Senior Customer Service & Sales Representative

HayGroup



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**Pgs 112-116**

**UMI**

## VITA

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1983	B. S. in Business Administration Chung-Yuan Christian University Chung-Li, Taiwan
1987	M. B. A. University of West Florida Pensacola, Florida
1987-date	Lecturer Tamsui Oxford University College Taipei, Taiwan

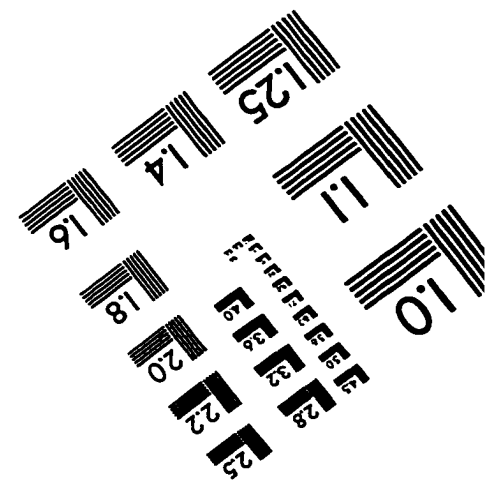
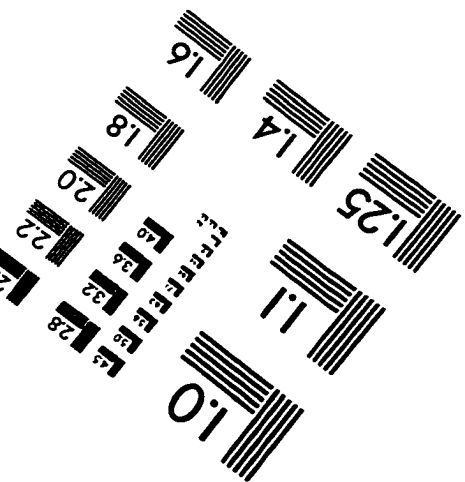
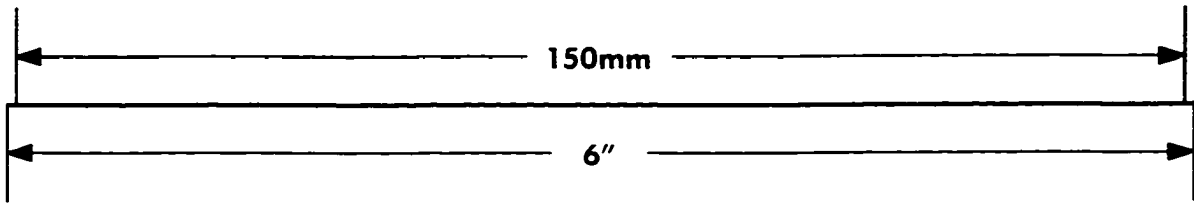
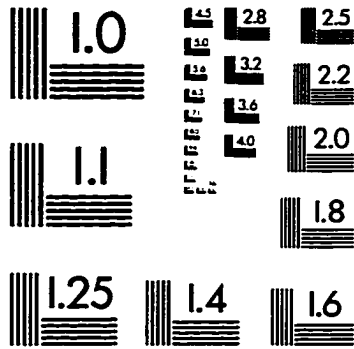
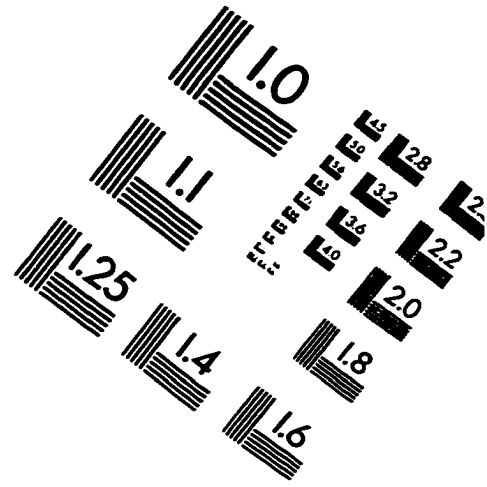
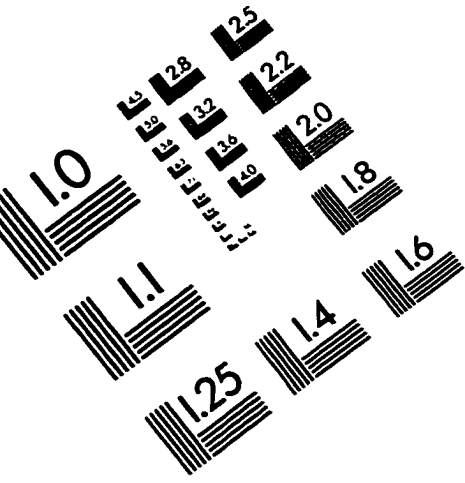
## PUBLICATIONS

Lin, B. S. (1988). A study on the firm's investment opportunities and cost of capital interact to determine its capital structure. Banking Management Report, (2), 3-4.

Lin, B. S. (1990). How to manage your personal surplus money: An introduction to instruments of short-term investment. Banking Management Report, (1), 4-5.

Lin, B. S. (1994). The evaluation of the operational performance of Taiwan's closed-end mutual funds in 1993. Banking Management Report, (1), 3-5.

# IMAGE EVALUATION TEST TARGET (QA-3)



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