

The relationship between gender, age, study mode, locus of control,
extracurricular activities, learning approaches and academic
achievement: the case of full-time and part-time Hong Kong Chinese
sub-degree students

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Yiu Kong Ringo CHAN
School of Education
University of Leicester

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Abstract

The relationship between gender, age, study mode, locus of control, extracurricular activities, learning approaches and academic achievement: the case of full-time and part-time Hong Kong Chinese sub-degree students

The massive expansion of self-financing sub-degree programmes is a major development in Hong Kong post-secondary education over the past decade. More full-time and part-time students from less advantaged academic backgrounds are able to access higher education. Given the specific nature and academic background of these students, there is a need to develop a greater understanding of major factors which shape their educational success.

Many studies have explored the relationship between individual student characteristics, learning approaches and academic achievement on Western tertiary students. Comparatively little is known about such relationship in the Hong Kong Chinese sub-degree context. The research aims to investigate the relationship between individual student characteristics, learning approaches and academic achievement of Hong Kong Chinese sub-degree finance students. Biggs's 3P learning model suggests that gender, age, study mode, locus of control and extracurricular activities influence learning approaches and subsequently affect academic achievement.

The present study uses a quantitative approach from the positivist paradigm to empirically test the 3P model of the relationships between gender, age, study mode, locus of control, extracurricular activities, learning approaches, and academic achievement. 131 full-time and 130 part-time Hong Kong Chinese sub-degree finance students participate in this research. Biggs's Revised Two-Factor Study Processes Questionnaire (R-SPQ-2F) and McAuley's Revised Causal Dimension Scale (CDSII) are used to measure learning approaches and locus of control respectively. Regression analysis is used to examine the fit of the variables to hypothesized models. The results suggest that locus of control and extracurricular activities influence the learning approaches of full-time and part-time Hong Kong Chinese sub-degree finance students. The study suggests that the deep approach is positively associated with academic achievement.

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Chapter 1 Introduction

1.1 Outline of the Research Problem

There is a long history of low participation rates in higher education in Hong Kong. Only 2% of the 17-to-20-year-old age group could receive higher education in 1980 in Hong Kong (Education and Manpower Bureau, 2006). The government altered its policy in 1989 to expand the university places from 8% in 1990 to 18% in 2000 (Mok, 2001). This change of policy is partly due to a large demand for a well-educated workforce and the removal of a highly qualified workforce through emigration during the pre-1997 period. The majority of places for government-funded undergraduate degrees go to secondary graduates who achieve the best results in public examinations.

In 2000, a target was set by the government to increase the percentage of senior secondary school graduates receiving higher and further education from 30% to 60% by doubling sub-degree places by the year 2010 (Tung, 2000). In response to the government policy for the massive expansion of higher education, the number of self-financed full-time sub-degree students such as higher diploma and associate degrees programmes offered by tertiary institutions had increased more than 550 percent from 2621 to 17,077 from 2000 to 2005 (Heron, 2006).

Given the growth of the Hong Kong sub-degree sector over the past decade, there is a need to develop a greater understanding of major variables to shape full-time and part-time sub-degree students' educational success. Studies on different variables such as individual student characteristics which influence learning approaches and academic achievement are important for sub-degree educators. Biggs's 3P (Presage Variable - Process Variable - Product Variable) learning model suggests that individual student characteristics influence their learning approaches and subsequently affect academic achievement (Biggs, 1987, 1989, 1992). To date, little research has been conducted on Hong Kong Chinese full-time and part-time sub-degree students. Through greater understanding of the relationships between individual student characteristics, learning approach and academic achievement, educators may be better equipped to design teaching methods and course

curriculum which may improve students' academic achievement.

Brains count a lot more than brawn in the 21st century. Different stakeholder groups such as employers, academics and students are necessarily attuned to different demands and circumstances. Comparatively little is known about any difference in learning approaches between full-time and part-time Hong Kong Chinese sub-degree students. The present study extends prior research as it is conducted in the setting of Hong Kong Chinese sub-degree finance students. The results of the present study may improve understanding of the relationship between individual student characteristics, learning approaches and academic achievement in the case of full-time and part-time Hong Kong Chinese sub-degree finance students. The findings have significant implications for sub-degree educators to help to enhance teaching practice, course curriculum and assessment. Accordingly, the main research questions are presented below.

1. Is there link between age, study mode, gender, locus of control, extracurricular activities and the learning approach of full-time and part-time Hong Kong Chinese sub-degree finance students?
2. Do full-time and part-time Hong Kong Chinese sub-degree finance students seek to use a particular learning approach?
3. What is the relationship between learning approach and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students?
4. Is there link between gender, locus of control, extracurricular activities, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students?

1.2 Objectives of the Research

The objectives of the present study are (1) to examine the psychometric properties of the research instruments including Biggs's Revised Two-Factor Study Processes Questionnaire (R-SPQ-2F) (Biggs *et al.*, 2001) and McAuley's Revised Causal Dimension Scale (CDSII) (McAuley *et al.*, 1992) for full-time and part-time

Hong Kong Chinese sub-degree finance students; (2) to investigate the effects of gender, age, study mode, locus of control and extracurricular activities on learning approaches; (3) to examine the relationship between learning approaches and academic achievement and (4) to investigate the effects of gender, age, study mode, locus of control, extracurricular activities and learning approaches on academic achievement. Biggs's 3P model contends that gender, age, study mode, locus of control and extracurricular activities influence learning approaches and subsequently affect academic achievement. The focus of the study is to identify the magnitude of the relationships between these variables among full-time and part-time Hong Kong Chinese sub-degree finance students.

1.3 Background of the Theoretical Framework

Some educators believe that academic achievement is closely associated with individual differences in academic ability (Bloom, 1976; Carroll, 1963; Schmeck & Grove, 1979; Walberg, 1980). Studies have shifted the focus of the study of individual differences in academic achievement to variables other than academic ability in differing contexts over many decades (Biggs, 1993a, 1993b; Drew & Watkins, 1998; Kember, 2001; Laurillard, 1979; Lizzio & Wilson, 2004; Marton & Säljö, 1976a, 1976b; Messick, 1994; Pratt *et al.*, 1999; Säljö, 1981; Schmeck *et al.*, 1991; Sinclair, 1991; Thomas & Bain, 1984; Watkins, 1986). These variables include locus of control (Crittenden, 1996; Findley & Cooper, 1983; Ho *et al.*, 1999; Stipek & Weisz, 1981; Watkins, 1984), learning approaches (Biggs, 1987, 1989, 1993a, 1993b; Curry, 1991; Entwistle & Ramsden, 1983; Murray-Harvey, 1994; Ramsden, 1988; Richardson, 2006; Wittrock, 1991), gender (Belenky *et al.*, 1986; Clinchy & Zimmerman, 1982; Gilligan, 1982; Meyer *et al.*, 1994) and teaching approaches (Prosser & Trigwell, 1999; Stevenson & Lee, 1996; Watkins & Biggs, 1996). Research studies have shown that individual student characteristics such as locus of control and self-concept are major variables affecting learning outcomes in tertiary education (Minnaert & Janssen, 1992; Power *et al.*, 1987; Watkins, 1986). The locus of control reflects students' attitude and responsibility allocation for their learning (Jonassen & Grabowski, 1993). An internal locus of control reflects a belief that students accept personal responsibility for their academic performance and academic achievement is related to the internal causes such as effort, study skills and interests. An external locus of control indicates that students have little

personal control over their academic performance and academic achievement is related to the external causes such as luck, teacher's help, family's help or course difficulty (Sinclair, 1991). Self-concept is defined as an individual's thoughts about the self and perception of self where experiences with the environment generate the perceptions and thoughts (Rosenberg, 1979; Shavelson *et al.*, 1976).

Educational researchers found that the traditional models of learning developed by psychologists were not enough for understanding the complexities of how students learn the higher cognitive skills required in higher education (Säljö, 1988). Cognitive skills refer to a faculty for the processing of information and applying knowledge to examine the logic of the argument, to interrelate with previous relevant knowledge and to relate concepts to experiences (Biggs, 1979). How student approach learning has been an important research area in higher education (Biggs, 1987; Entwistle, 1981; Hattie, 2008; Marton & Säljö, 1976a, 1976b). The term learning approach refers to the relative emphasis on the understanding of concepts or the memorization of facts. A large amount of model development and empirical tests has been conducted in the area of student learning in tertiary education over the past two decades (Hattie, 2008; Marton & Booth, 1997; Marton *et al.*, 1997; Prosser & Trigwell, 1999). Research has consistently identified two major learning approaches which are called the deep and surface approach (Biggs, 1987; Marton & Säljö, 1976a, 1976b; Murphy & Tyler, 2005).

Biggs (1979) suggested that students undertake the deep or surface approach which are influenced by the corresponding motive and strategy at tertiary level. Technically speaking, a student's motive for learning influences their learning strategy. The combination of motive and strategy is called a learning approach. The motive refers to why students want to engage in learning. The strategy reflects how students approach a learning task. The surface approach is related to extrinsic motivation. Extrinsic motivation reflects that students carry out the learning task due to positively reinforcing consequences but students need to balance avoiding failure against working too hard. Biggs (1987, p.15) explained that extrinsic motivation was displayed when a student "sees the task as a demand to be met, a necessary imposition if some other goal is to be reached (a qualification for instance)." Life will be unpleasant if students are not willing to engage in the

learning task and fail to gain a paper qualification. The strategy used focuses on selected details and reproduction of knowledge without an in-depth involvement with the learning task. The surface approach emphasizes a reproduction of learning materials normally not involving understanding to meet the minimum requirements in course assessment (Biggs, 1993a, 1993b). Students tend to assimilate the learning materials without any further analysis, deal with a problem without showing interest and are concerned with time required to complete the learning task. Students adopting the surface approach seek to meet the teacher's minimal requirements with minimal time and effort (Biggs, 1993a, 1993b).

The deep approach, on the other hand, is related to intrinsic motivation. Intrinsic motivation reflects students seek meaning from their learning tasks in order to satisfy their curiosity about topics and interest in the subject matter of the learning task. Biggs (1987, p.15) characterised intrinsic motivation as displayed when “a student is interested in the academic task and derives enjoyment from carrying it out”. Intrinsic motivation is desirable in learning because it provokes “the return to a previously encountered task or task area on one's own without apparent external constraint to do so” (Maehr, 1984, p.119). Students who are intrinsically motivated will continue their learning because positive feelings such as enjoyment, pleasure, and satisfaction are acquired (Ushioda, 1996). Deci (1978) stated that “intrinsically motivated learning will involve trial and error, following one's curiosity, feeling free to learn what interests one, developing one's potential as one experiences it (p.198)”. The strategy used is designed to maximize understanding and involve a personal commitment to learning, which means that students link the learning content to personally meaningful contexts or to previous knowledge. The deep approach refers to a real understanding of what is learned in which students understand the content, the argument and the meaning of the learning materials and are able to construct a critical view. The deep approach implies an active orientation to the learning task with a focus on a search for meaning (Biggs, 1993a, 1993b). Students adopting the deep approach feel the learning task is interesting and challenging and there is in-depth personal involvement with the task. Students read widely, discuss with their peers and teachers, think about the task or problem constantly, form a critical view and seek integration between the current learning task and their previous knowledge (Biggs, 1993a, 1993b). The subjective rewards

such as enjoyment, satisfaction, or feelings of success arise from engagement in learning tasks bring a self-sustaining pattern of motivation in learning (Ushioda, 1996).

Biggs's 3P learning model (Biggs, 1987, 1989, 1993a, 1993b) offers a comprehensive theoretical framework on student learning especially in higher education. The 3P model assumes that students complete their learning tasks for a variety of reasons and these reasons influence the way they do their learning tasks. The 3P model addresses three components in the classroom which proposes that personal and situational factors influence a student to adopt a specific approach to learning which influences the academic achievement. The model which was developed originally by Dunkin and Biddle (1974) showed classroom learning as a multivariate integrated system of a mixture of presage, process and product variables. These three sets of variables include (1) before the learning takes place such as the learning environment and individual student characteristics (presage), (2) while learning is taking place; i.e. students' approach to learning (process) and (3) the learning outcomes after learning has taken place (product). The model proposes that personal and situational factors (presage) influence a student to adopt a specific approach to learning (process) which influences the academic achievement (product).

Presage components consist of two kinds of factors. Individual student characteristics presage factors brought to the learning situation include prior knowledge, gender, age, academic background and personality. Teaching presage factors include the teachers' personal characteristics and institutional factors such as teaching methods, course assessment, workload and curriculum content. Learning approaches are the process factors. The academic achievement which students achieve from the learning process is the product factor. The product factor can be described quantitatively (how much is learned), qualitatively (how well it is learned) and institutionally (grade point averages). In general, depth or accuracy of learning has been measured through assessment results such as grade point averages. Marton & Säljö (1976a, 1976b) and Watkins (2001) contended the deep approach was associated with qualitatively better learning outcomes.

The studies of the factors relating to academic success are key topics in higher education (Ruban & McCoach, 2005). Studies on factors which influence academic achievement are important for teachers and students who are concerned about the reasons for academic success. Academic achievement is an important predictor of performance at other levels of education and of job outcomes such as job performance and salary (Kuncel *et al.*, 2005). The 3P model serves as the conceptual framework for the present study in which the relationships between individual student characteristics, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree students are examined. Empirical studies are carried out using surveys.

The nature of the tertiary sector has changed markedly with respect to factors such as the changing teaching contexts, accountability, the concerns with quality assurance, the structure and administration of education institutions, the spectrum and depth of curricula, methods of course delivery and course assessment in Hong Kong (Chiu & Cunich, 2008). Although the sub-degree institutions play an increasingly important role in Hong Kong's higher education system, there has been less written about the empirical test of the 3P model on full-time and part-time Hong Kong Chinese sub-degree students.

Following the massive expansion of higher education in Hong Kong, considerable pressure has been put on the human resources within the system. There is a pressing need to understand the relationship between individual student characteristics, learning approaches and academic achievement in order to enhance the effectiveness of student learning in sub-degree learning environment. Teachers may make use of the relationships between individual student characteristics and learning approaches. For example, teachers may teach students about the value of being conscientious and being open-minded about their learning tasks in an attempt to lead students to cultivate an internal locus of control belief towards their learning tasks. Teachers may assign tasks such as group discussion and project-based learning in an attempt to encourage students to adopt the deep approach.

1.4 Recent Development in Hong Kong Higher Education

The Hong Kong educational system is regarded as competitive and

examination-oriented (Hau, 1992). Entry to government-funded universities is very selective and assessed by a series of public examinations in Hong Kong. The secondary school system is mostly free and compulsory. Each Hong Kong primary and secondary school obtains the same amount of funding per student which is US\$2,180 per primary student and US\$3,252 per secondary student (Hong Kong Government, 1997). A number of international schools, however, do not obtain Government funding in Hong Kong. The equal school funding diminishes the adverse impact on poorer students entering poorer schools, a phenomenon which is observed in the US (Betts *et al.*, 2000). The government released a white paper in relation to the expansion of tertiary education in 1978 which projected that enrolment in the universities would reach 14.5% of the population in 1988. It was difficult to rely on the two traditional universities including the University of Hong Kong and the Chinese University of Hong Kong to reach this target. The government altered its policy in 1989 to expand the university places from 8% in 1990 to 18% in 2000 (Mok, 2001).

Sub-degree programmes are often taken by students from less advantaged academic backgrounds who are not able to achieve sufficiently high grades in public examinations to obtain an offer on a full-time undergraduate programme due to a limited number of government-funded university places in Hong Kong. Using the sub-degree programme as a stepping-stone into university, therefore, is a major objective for these students to gain admittance to the government-funded universities in Hong Kong. Some students have been prevented from completing schooling because of economic factors. For example, some students are able to continue their post-secondary study in overseas countries but such opportunities may not be available for low income groups in Hong Kong (Chiu & Cunich, 2008). Some worked their way up through different route. Part-time sub-degree programmes provide an opportunity to extend the education beyond the period of compulsory schooling for those who did not have that chance in higher education.

The government-funded universities played a major role in the higher education in the past. The number of government-funded universities had increased from 2 to 8 by 2003. The list includes the University of Hong Kong, Chinese University of Hong Kong, City University of Hong Kong, Hong Kong Baptist University, Hong

Kong Polytechnic University, Hong Kong University of Science and Technology, Lingnan University and Hong Kong Institute of Education. Hong Kong still has an elite university system. Most students go directly from secondary school to government-funded university in Hong Kong. The role of private higher institutions is very limited in Hong Kong. The first private university in Hong Kong, Shue Yan University, a private higher education institution with a 35-year history, was recognized by the government in 2006 (Chan & Lo, 2007). It is notable that graduation rates from all government-funded universities are high. Once at university, it appears that there is a lessening of the public examination pressures (Mok, 2001).

The Hong Kong Education Commission document “*Learning for Life: Framework of Education Reform*” (Education Commission, 2000) emphasized the need to provide a diversified, multi-channel and multi-layer higher education system in Hong Kong. This policy proposal pointed out the need to offer opportunities for Hong Kong people to develop their skills and competencies in an attempt to maintain Hong Kong’s competitiveness in the knowledge-based economy. A target was set by the government in 2000 to increase the percentage of senior secondary school graduates receiving higher and further education from 30% to 60% by the year 2010 (Tung, 2000). “In achieving this target, the government will facilitate tertiary education, private enterprises and other organizations to provide options other than the traditional sixth-form education, such as professional diploma courses and sub-degree courses” (Tung, 2000, p.23). The growth of associate degree and higher diploma programmes on a self-financing basis has emerged in Hong Kong (Lam & Hui, 2006). Other developed nations such as South Korea and US had reached the 80 percent target for participation of high school-leavers in higher and further education and Australia reached 70 percent (Heron, 2006).

Continuing education is another major education development in Hong Kong over the past twenty years (Chiu & Cunich, 2008). The scope for continuing education includes not only part-time studies in a range of certificate, diploma, degree, masters and doctorate level but also full-time post-secondary educational provision. Continuing education units of the government-funded universities and private education institutions offer various sub-degree or degree programmes with

distance learning or face-to-face teaching in collaboration with universities from Australia, UK, US and Mainland China on a financially self-sustaining basis. Continuing education is viewed as an alternative to a range of post-secondary educational provision and is an important part of a multi-channel and multi-layer higher education system in Hong Kong.

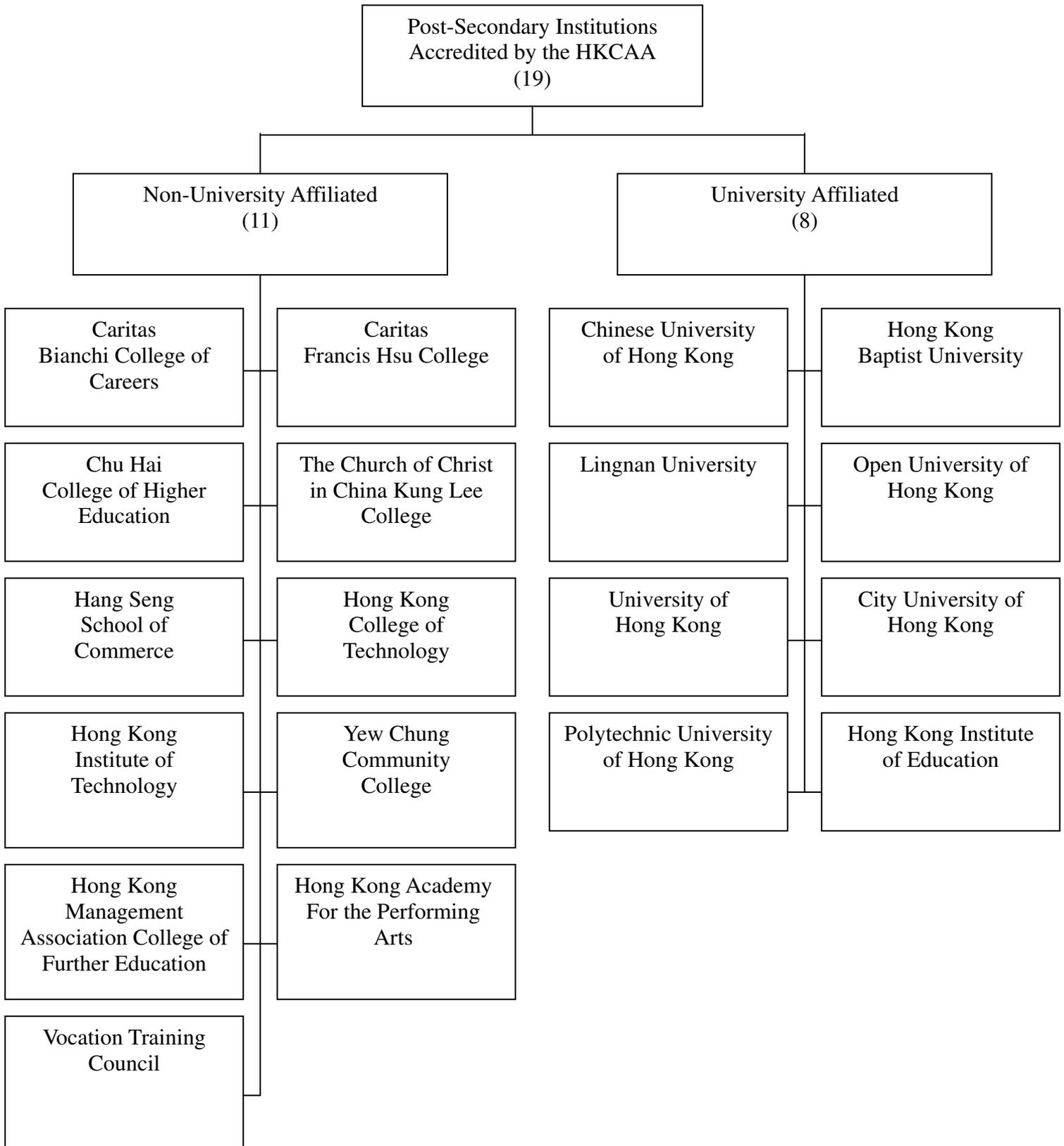
The community college is a pioneering movement in the Hong Kong higher education system which is modelled largely on the North American system and it has been the gateway for students on the verge of enrolling in government-funded universities (Chiu & Cunich, 2008). The objectives of sub-degree (associate degree and higher diploma) programmes offered by the community college are to provide an education that prepares students for work and further study. By emphasizing a combination of broad-based education and practical specialisms, the programmes aim to provide students with a solid foundation of generic skills including languages, interpersonal, communication, quantitative, problem-solving, analytical and critical thinking and to enhance whole person development by broadening the learners' perspectives (Lee & Young, 2003). The widening of access to higher education is important for Hong Kong to maintain its competitiveness. The self-financing sub-degree programmes offered by community colleges may be a practical solution to upgrade the quality of the human resources without the support of government funding in Hong Kong.

The associate degree programme is a stand-alone qualification designed to provide an alternative education path on a vocational basis or academic enhancement for further studies in the US. Advocates of community colleges argue that these colleges provide access to higher education for academically-disadvantaged secondary school graduates who would be otherwise barred from entering universities (Cohen, 2001). Students could be using the community college to improve their academic knowledge and develop vocational skills.

Community colleges in Hong Kong are under three different jurisdictions: (1) University Grants Committee (UGC); (2) Vocational Training Council (VTC); and (3) independent (self-financing). Under these jurisdictions, there are university

affiliated or non-university affiliated community colleges. The following charts illustrate the different types of community colleges in Hong Kong.

Chart 1 Community Colleges in Hong Kong accredited by the Hong Kong Council for Academic Accreditation (HKCAA)



Notes: () Figures in brackets represent the number of schools as provided by the Hong Kong Council of Academic Accreditation (HKCAA)

Source: HKCAA

Chart 2: University Affiliated Community College Units

University	Abbreviation of University	Community College Unit affiliated with the University
Chinese University of Hong Kong	CUHK	CUHK-Tung Wah Group Hospitals Community College
City University of Hong Kong	CityU	Community College of City University
Hong Kong Baptist University	HKBU	HKBU Community College
Hong Kong Institute Education	HKIED	HKIED Community College
Hong Kong Polytechnic University	PolyU	Hong Kong Community College
Lingnan University	LU	LU Community College
Open University of Hong Kong	OUHK	OUHK
University of Hong Kong	HKU	HKU SPACE Community College AND HKU SPACE Po Leung Kuk Community College

School systems in the US were egalitarian by the 19th century. The community college is an American system which transformed the Western world to an egalitarian approach to education (McLean, 1995). Schools were formed to offer universal opportunities and against formal and institutional barriers of class differentiation. The first community college was established in Illinois in 1901 (Vaughan, 1999). The aims of the community college are to provide students with pre-professional education and to prepare students for a transfer to a university and for general education. Community college systems are modelled after the US around the world which offer support for the principles of economic equality and opportunity. American university education provides a four-year degree which emphasizes theory; in contrast, the community college focuses on applied learning and vocational skills enhancement.

The value of the community college is stated as: “Community colleges are public institutions of higher education. They are characterized by a two-year curriculum that leads to either the associate degree or transfer to a four-year college. The transfer programme parallels the first two years of the four-year college. The degree programme generally prepares students for direct entrance into an occupation. Because of their low tuition fee, local setting, and relatively easy entrance requirements, community colleges have been a major force in the post-World War II expansion of educational opportunities in the United States. They are also referred as junior colleges.” (Columbia Electronic Encyclopedia, 6th edition, Columbia University Press)

American community colleges offer a wide range of broad-based liberal studies and highly vocational studies. There are nearly 1200 community colleges in the US recognized by the American Association of Community Colleges (AACC) in 2006. About 87% are government-funded and 13% are operated on a self-financing basis. About 44% of community college students transfer to the undergraduate programmes in 2007 (<http://www.aacc.nche.edu>). Students with financial constraints are rated community college as their first choice to transfer to the degree programme. Community colleges are no longer looked upon as a second choice for the academically-disadvantaged students in the US. Thirty states have passed legislation to ensure the credit transfer from selected community colleges to public

universities (Levin, 2001).

The Hong Kong community college system is modelled after both the American and British higher education system. The development of the associate degree is influenced by American model. The higher diploma programmes are modelled on the United Kingdom's Higher National Diploma (HND) and have a longer history than the associate degree programmes in Hong Kong (Wagner, 2001). With a significant shift of the manufacturing base from Hong Kong to Mainland China and a rapid expansion of service industries in Hong Kong during 1990s, there is an urgent need for higher education and skills training for Hong Kong people. The Vocational Training Council and two Hong Kong Technical Colleges provide higher diploma programmes in the 1980s. The Higher Diploma tends to be towards vocational and technical programmes (Chiu & Cunich, 2008).

Associate degree or higher diploma programmes operate on the basis of a three-year and a two-year curriculum. Secondary form five graduates with a minimum of passes in English, Chinese and Mathematics will be admitted to the first year of the three-year programme. Secondary form seven graduates will be admitted to the first year of the two-year programme. With a satisfactory academic performance, community college graduates are expected to transfer to second year at government-funded or British-style three-year university programmes or to third year at overseas or American-style four-year university programmes (Chiu & Cunich, 2008).

The University of Hong Kong, the Hong Kong Baptist University and the Chinese University of Hong Kong have established their community college to offer associate degree or higher diploma programmes since 2000. Most of the government-funded universities have established their community colleges providing full-time self-financing sub-degree programmes including associate degree, higher diploma and professional diploma in 2007 (Chiu & Cunich, 2008). The government only offers partial financial assistance to these sub-degree students including means-tested grants, non-means-tested loans and travel subsidies (Education and Manpower Bureau, 2006). The HK\$5 billion Continuing Education Fund sponsors students to pursue continuing education, training courses and

sub-degree programmes to facilitate the expansion of higher education sector. The government has used a public-aided approach to expand the higher education sector from public dominance to a public-private combination.

The Department of Extra-mural Studies was established by the University of Hong Kong in 1956, the first continuing education unit in a university in South-East Asia, with a mission of providing higher educational and lifelong learning opportunities to the community. The institution was re-named as The School of Professional and Continuing Education of The University of Hong Kong (HKU SPACE) in 1992. HKU SPACE offered 1,077 part-time continuing education programmes and a total number of enrolment was 111,708 in 2006 (Chiu & Cunich, 2008). HKU SPACE offers many part-time programmes as joint ventures with overseas universities from Australia, the United Kingdom, the United States and the Mainland China from degree to doctorate level, professional programmes and short courses for personal, professional and career advancement to people from all walks of life. The delivery mode is mostly face-to-face lectures and tutorials as well as on-line learning.

HKU SPACE had taken the lead by setting up the first community college in March 2000 to provide the first-of-its-kind associate degree programmes on a self-financing basis to serve as an alternative route to higher education in Hong Kong as a response to the Education Commission's call for the expansion of sub-degree programmes (Lee & Young, 2003). The community college offers flexible modes of learning including group discussions, project-based learning, on-line learning and experiential learning. The college has nearly 5,000 students in its associate degree and higher diploma programmes in 2007. Teachers are not likely to adopt an examination-oriented teaching mode in order to ensure students achieve high academic grades in the competitive A-level examinations (Chiu & Cunich, 2008).

Two education goals of the community college are to offer specialized vocational training and academic preparation for continuing higher education in Hong Kong. The college encourages students to use the deep learning approach, that is, the attempt to think through the material and master its intricacies. The fundamental

teaching principle of the community college is to provide a student-oriented and interactive learning environment.

The massive expansion of sub-degree programmes is a major development in Hong Kong post-secondary education over the past decade. The Hong Kong government intends that the expansion of higher education would be driven by self-financing education institutions due to budgetary constraints. The self-financing associate degree or higher diploma programmes are seen as bridging programmes to the degree programme in Hong Kong. Under this new articulated system of post-secondary education, more students from less advantaged academic backgrounds are able to access higher education. Given the specific nature and academic background of these students, there is a need to develop a greater understanding of major factors which shape their educational success.

With a portrayal of an examination-oriented and utilitarian type of education, there have been anecdotal descriptions about Hong Kong Chinese students as rote-learners. It is argued that the examination-oriented entry selection results in a didactic teaching and rote-learning approach for most secondary school students in Hong Kong (Watkins & Biggs, 2001). For most of the sub-degree students, their previous educational experiences can be summarized as didactic teaching and passive learning in response to tightly structured examination-oriented courses. Research studies in various countries (Entwistle & Ramsden, 1983; Kember & Gow, 1991; Marton & Säljö, 1976a, 1976b; Thomas & Bain, 1984) showed that students were likely to adopt the surface approach rather than the deep approach if the learning environment was unfavourable such as didactic teaching approach, heavy workloads and lack of intrinsic motivation.

1.5 Significance of the Research

The aim of the present study is to investigate the relationships between age, gender, study mode, locus of control, extracurricular activities, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree students by using the 3P model. The 3P model is not a theory to explain how to teach but a framework for putting together the key variables in the classroom to understand the way they may operate in relation to each other. The 3P

model was empirically tested in the context of secondary and tertiary students in Hong Kong (Biggs 1987, 1989, 1992; Chan *et al.*, 1991; Drew & Watkins, 1998). The present study is not concerned with systematically operationalising and testing all possible variables of the 3P model. Although the 3P model provides a comprehensive conception of the relationships between individual student characteristics, learning approaches and learning outcomes at tertiary level, empirical results of the model for university students in Australia, Hong Kong, US and UK are mixed partly due to differences in the context of the learning environment, learning culture and disciplines (Marton & Säljö, 1997; Prosser & Millar, 1989; Ramsden, 1992; Trigwell & Prosser, 1991; Van Rossum & Schenk, 1984).

The present study uses a quantitative approach from the positivist paradigm to empirically test the 3P model of the relationships between gender, age, study mode, locus of control, extracurricular activities learning approaches, and academic achievement. A quantitative method is employed to test the model because the focus of the study is the relationships to explain how the variables are related with each other. The variables and hypothesis are developed and operationally defined in the present study to test theories by using large enough samples in an attempt to answer specific research questions. The research questions are addressed through a survey method. Academic achievement is measured by grade point average. The survey instrument measuring locus of control is the Revised Causal Dimension Scale (CDSII) (McAuley *et al.*, 1992). Biggs's Revised Two-Factor Study Processes Questionnaire (R-SPQ-2F) (Biggs *et al.*, 2001) is used to evaluate learning approaches.

The present study is conducted with three cohorts of full-time and part-time sub-degree finance students because it is one of the major programmes with sufficient numbers of full-time and part-time students to facilitate a comparison of study mode in the present study. 131 full-time and 130 part-time Hong Kong Chinese final-year sub-degree finance students participate in this research on a voluntary basis. Both full-time and part-time students are from Hong Kong and have Cantonese as a first language. Multiple regression analysis is used to examine the relationship between presage and process variables and to examine the fit of the

variables to hypothesized models. Although the community colleges have an increasingly important role to play in Hong Kong higher education that was not envisaged ten years ago, there has been less written about the empirical test of the 3P model on Hong Kong Chinese sub-degree students. The present study tries to fill that gap at a time of rapid development of sub-degree programmes in Hong Kong. An understanding of the relationship between individual student characteristics, learning approaches and academic achievement can assist teachers in curriculum design and in using different measures to facilitate the deep approach. The establishment of this relationship may allow teachers and counsellors to improve students' academic achievement.

Enhancement of the quality of student learning is one of the key topics in higher education (Albaili, 1997; Biggs, 1987; Cano, 2005; Drew & Watkins, 1998; Hattie, 2008; Ho *et al.*, 1999, Lizzio *et al.*, 2002; Prosser & Trigwell, 1999; Salili *et al.*, 2001; Stevenson & Lee, 1996; Trigwell & Prosser, 1991; Zhang, 2000). Given the growth of the Hong Kong sub-degree sector and calls to enhance students' learning outcomes in higher education, there is a need to develop a greater understanding of students' learning approach and academic achievement. Considerable pressure has been placed to improve quality of teaching and learning. The findings of this study on the relationship between individual student characteristics and learning approaches could help toward building a learning model and improve the quality of student learning outcomes. The results of the study may provide an additional level to the understanding of the impacts of individual student differences on their learning approaches and academic achievement in Hong Kong sub-degree learning environment. Teachers seeking to motivate sub-degree students may need to pay particular attention to how they frame the relevance of students' learning approaches.

It is hoped that the results of the present study may improve understanding of how these variables and learning approaches differ in the case of part-time and full-time Hong Kong Chinese sub-degree students. Comparatively little is known about any difference in learning approaches between full-time and part-time sub-degree students in the Hong Kong context. The findings may provide clues to the inconclusiveness of past research especially in Hong Kong Chinese sub-degree

students.

1.6 Structure of the Thesis

The study is organized into five parts. Chapter 2 begins by describing the framework for the study, research objectives, literature reviews on learning models, Biggs's 3P model and characteristics of Hong Kong Chinese sub-degree students. Chapter 3 is followed by an explanation of the research paradigm, methodology, research instruments and data collection procedures. Chapter 4 contains the empirical results of two studies. Study one validates research instruments and tests the relationships between the individual student characteristics and learning approaches of both full-time and part-time Hong Kong Chinese sub-degree finance students. Study two focuses on empirical tests of the relationship between academic achievement and learning approaches as well as the relationships between individual student characteristics and academic achievement of both full-time and part-time Hong Kong Chinese sub-degree finance students. Chapter 5 provides discussion of research findings, implications of the results and limitations of the study. The conclusions in chapter 6 contain an overall summary of research findings, suggestions on sub-degree teaching and learning and recommendations for future studies.

Chapter 2 Literature Review

2.1 Introduction

Some educators (Bloom, 1976; Carroll, 1963; Schmeck & Grove, 1979; Walberg, 1980) believed that individual differences in academic ability exert a strong impact on academic achievement. For the past three decades, many studies have shown that academic achievements can be affected by individual differences other than academic ability and these differences include self-concept, self-confidence, self-esteem (Allen, 1992; Fuertes *et al.*, 1994; Hau, 1992; Hau & Salili, 1991; Ho *et al.*, 1999; Kwok & Lytton, 1996; Schmeck *et al.*, 1991; Sinclaire, 1991), gender (Arnor *et al.*, 1999; Davies & Brember, 2001; Herlitz *et al.*, 1997; Meyer *et al.*, 1994; Miller *et al.*, 1990; Richardson & King, 1991; Ruban & McCoach, 2005; Sadler-Smith, 1996; Stumpf & Jackson, 1994; Thomas, 1988; Wilson *et al.*, 1996), age (Boon, 1980; Clennell, 1990; Harris & Brooks, 1998; Nyberg *et al.*, 1996; Richardson, 1995; Richardson & Woodley, 2003; Sadler-Smith, 1996; Sadler-Smith & Tsang, 1998; Watkins & Hattie, 1985; Woodley, 1984), ethnicity (Hackett *et al.*, 1992), and self-efficacy (Lizzio & Wilson, 2004; Murphy & Tyler, 2005; Wilhite, 1990). Many research studies on tertiary education in the West have explored the impact of different learning approaches on learning outcomes (Beckwith, 1991; Hattie, 2008; Trigwell & Prosser, 1991; Watkins, 1983; Zeegers, 2001). This chapter provides a review of the literature on different models of student learning. The conceptualisation of student learning and the development of student learning models will be reviewed first to illustrate that the surface and deep learning approach play a key role with respect to academic achievement. The literature relating to Biggs's 3P learning model demonstrates the theoretical relationships between individual student characteristics, learning approaches and academic achievement. A number of arguments for the 3P model are evaluated from different perspectives. Finally, applications of the 3P model are discussed in the Hong Kong Chinese sub-degree context.

Learning is a complex activity and can be viewed as the interaction of individual student characteristics, learning process, teaching environment and learning outcomes (Richardson *et al.*, 1987). Students undertake a learning task from the perspective of their own needs, perceptions, motivation and existing resources.

Each of these factors influences every other factor (Biggs, 1987). Different learning models provide a theoretical framework of the relationships between the individual student characteristics, teaching environment, assessment, learning processes and learning outcomes. The term learning approach refers to the processes used by the student to achieve the learning outcomes (Entwistle, 1988). Students have different motives for learning and their expectations influence their learning outcomes. The learning approach adopted depends on variables within the students as well as teaching and learning environment. In turn, how students approach their learning will affect their learning outcomes. The learning outcomes can be defined quantitatively which is how much a student learns and qualitatively which is how well a student learns. Both quantitative and qualitative learning outcomes are measured through assessment results such as course work, tests and examinations to generate grade point averages.

The study of student learning has become an important research area over the last 30 years in higher education (Biggs, 1987, 1989, 1993a, 1993b; Curry, 1991; Entwistle & Ramsden, 1983; Hattie, 2008; Leung & Kember, 2003; Marton & Säljö, 1976a, 1976b; Murray-Harvey, 1994; Ramsden, 1988; Richardson *et al.*, 1987; Säljö, 1981; Trigwell & Prosser, 1991; Watkins & Biggs, 1996; Wittrock, 1991; Zhang, 2000). Through greater understanding of the relationship between learning approach and academic achievement, educators may be better equipped to design appropriate learning materials and teaching methods which improve students' learning outcomes. There has been an important conceptual shift from considering the learner as a passive recipient of information to viewing the learner as an active processor of information over the past 30 years (Biggs, 1978, 1979, 1984, 1985, 1987, 1989, 1992; Entwistle, 1981, 1987, 1988; Entwistle & Ramsden, 1983; Hattie, 2008; Marton & Säljö, 1976a, 1976b; Trigwell & Prosser, 1991; Watkins, 1982, 1984, 1998). This shift has been associated with increasing recognition of the importance of cognitive and social constructivist theories of learning. Some earlier studies (Bennett, 1978; Bloom, 1976; Carroll, 1963; Gagne, 1974; Wissler, 1903) were conducted to identify variables that can be used to predict academic achievement. These studies focused on the impact on academic achievement of such factors as Intelligence quotient (IQ), socio-economic status, prior knowledge, interest in the subject matter, the instructional process and environmental

characteristics. These studies emphasized how much students had learned. Studies by Marton and Säljö (1976a, 1976b) focused on qualitative differences in how tertiary students approached learning and argued that previous studies were insufficient for explaining the complexities of how students learn in higher education. Different factors such as individual student characteristics, teaching environment, peer impact, assessment methods and study mode might have various degrees of impact on student learning in primary, secondary and tertiary education. That view has been influenced by the recognition that student learning in higher education such as community college and university has its own distinctive context. A different learning model is needed to investigate the interaction of individual student characteristics, learning and teaching environment and academic achievement in higher education sector.

2.2 Models of Student Learning

A number of models have suggested that student learning outcomes are influenced by a variety of variables which include individual student characteristics, teaching environment, teaching methods, and demographic factors (Biggs, 1993a, 1993b; Haertel *et al.*, 1983; Kember, 2001; Laurillard, 1979; Lizzio & Wilson, 2004; Marton & Säljö, 1976a, 1976b; Messick, 1994; Pask, 1988; Pratt *et al.*, 1999; Prosser & Trigwell, 1999; Ramsden, 1987; Reid, 1989; Säljö, 1981; Schmeck *et al.*, 1991, Sinclair, 1991; Thomas & Bain, 1984; Watkins, 1986). The following models (Carroll, 1963; Bloom, 1976; Bennett, 1978; Bloom, 1976; Gagne, 1974; Glaser, 1976; Harnischfeger & Wiley, 1976; Walberg, 1980) outline some holistic conceptions of student learning in classroom settings. These models demonstrate the link between cognitive factors, the teaching process, the study environment and learning outcomes.

Carroll's model (1963) suggested that the degree of student learning is a function of five key variables which are (1) aptitude, (2) the ability to understand instructions, (3) perseverance, (4) an opportunity to learn and (5) the quality of instruction. All of the factors that directly affect student learning can be explained by the amount of time actually spent in the course of a learning task which resides within the individual. Carroll's model establishes a solid conceptualization of student learning which has influenced the development of other learning models.

Bloom (1976) proposed that the students' affective entry characteristics are major pre-requisites for learning. Affective entry characteristics are conceived as task-specific attributes which include their attitude toward the subject matter, attitude toward school and individual self-concept. Bloom argued that improved attitudes toward school and an improved self-concept are factors which affect successful learning experiences.

Bennett (1978) proposed that quantity of schooling, time allocated to curriculum activity, total active learning time, total content comprehended, achievement on curriculum tasks and feedback are major factors influencing success in primary school learning. The model defines student learning activities as mediating all other features of the learning situation and emphasizes that learning time is a key element of learning achievement; the amount of learning time is directly related to achievement. All of the above models are concerned with both quantity and quality of instruction. Quantity of instruction consists of time and opportunity to learn; quality of instruction is concerned with learning outcomes which are measured by the acquisition of content or academic outcomes.

The following three learning models have originated from psychological learning theory. Bruner's learning model (1966) proposed four major components of instruction: (1) implanting a pre-disposition toward learning; (2) structuring the body of knowledge to be taught; (3) sequencing the presentation of materials to be learnt; and (4) specifying the nature of rewards and punishments. He stressed that the curricula should provide different possibilities for structure and sequence in order to offer various options for all learners.

Gagne's learning model (1974) revealed eight types of learning, the learning outcomes and the required conditions to generate them. His model emphasizes the importance of specific intended learning outcomes for individual students which require various types of learning environments. Four key categories of learning outcomes including (1) verbal information; (2) intellectual skills; (3) cognitive strategies and (4) attitudes are needed in response to various types of learning conditions. The model indicates that instructional design could offer external

support to improve the desired learning outcomes. Gagne provides different examples to illustrate how specific intended learning outcomes could be achieved in different types of learning conditions. The model is concerned with both the acquisition of content and changes in students' attitude.

Glaser (1976) proposed a theory of teaching and learning organized around four requirements: (1) an analysis of the competence and skills to be comprehended; (2) a description of the initial phase of learning; (3) implementation of conditions to make the change from the student's initial state to the state of competence; and (4) assessment criteria to determine the short- and long-term outcomes of the conditions implemented. The model points out that many aspects of teaching are based on the use of information derived from assessment rather than the personality of the teacher.

These three models emphasize instruction through a series of stages or phases and are not concerned with learning time and individual personality. They highlight the importance of cognitive learning outcomes beyond the acquisition of content. Higher order outcomes including intellectual skills, cognitive strategies, the process of knowledge acquisition and ability for lifelong learning are emphasized by these three models which had various implications for the development of curriculum and instructional procedures.

Walberg (1980) proposed a model of educational productivity which described nine educational productivity factors that have causal impacts on learning. These factors include intellectual ability, motivation, student age, quantity and quality of teaching, social and psychological environments of the class, home and peer group and exposure to the mass media such as TV. Each of these factors may be necessary but are insufficient by themselves for the acquisition of content and classroom learning. Three clusters are generated by these nine factors which are aptitude, teaching, and the learning environment.

All of the above models suggest that the degree of student learning in classroom environments is a function of aptitude, time allocated to curriculum activity, the social environment of the class, and the quantity and quality of teaching at primary

and secondary level. The models provide a holistic framework for student learning in classroom environments. The learning outcomes of these models emphasize the acquisition of content or academic achievement. But none of these models demonstrates an exact relationship between different factors at tertiary level.

Marton and Säljö (1976a, 1976b) revealed dissatisfaction with the above studies which emphasized how much students had learned. In the context of students reading a text, Marton and Säljö (1976a, 1976b) found that students adopted a learning approach with one of two intentions – to remember the words used or to try and understand the author’s meaning. If the motive was to memorize the original words, the student would remember the words; if the motive was to discover meaning, they would try to understand the text. In their research, they focused instead on qualitative differences in how students approached learning and identified two major learning approaches -- deep and surface approach. The outcome of the reading or the students’ understanding of the text is determined by the learning approach.

Studies in learning approaches (Biggs, 1978; Marton & Säljö, 1976a, 1976b; Entwistle & Ramsden, 1983) reported the differences between the deep approach and surface approach. The surface approach points to an understanding of the text as a fragmentary word list. The surface approach emphasizes a reproduction of learning materials not involving understanding to meet the minimum requirement in assessment. The deep approach emphasizes an active orientation to the learning materials with a focus on a search for meaning. The deep approach results in meaningful understanding. Related studies (Marton & Säljö, 1997; Prosser & Millar, 1989; Ramsden, 1992; Trigwell & Prosser, 1991; Van Rossum & Schenk, 1984) found that the surface approach lead to poorly structured and lower quality learning outcomes and low grade point average. Marton (1981) suggested that research into learning should be undertaken from the perspective of the student rather than that of the teacher or the academic researcher. Säljö (1988) argued that the learning models previously discussed were insufficient for explaining the complexities of how students learn the higher cognitive skills required in tertiary education. The focus is on how students use knowledge to interpret or argue their views or reality, rather than on what or how much they know.

Some studies on student learning (Biggs, 1987; Entwistle, 1987; Evans *et al.*, 2003; Gibbs, 1992; Kember *et al.*, 2008; Ramsden, 1987) have focused on the differences between individual students in terms of the styles and strategies which they use and the importance of their cognitive and affective processes in achieving learning outcomes. The cognitive approach emphasizes the students' perceptions, strategies and interpretations of learning, as well as the importance of their cognitive and affective processes in mediating the impact of teaching environments upon learning outcomes. Studies derived from the application of a number of instruments such as the Approaches to Student Inventory (ASI) (Entwistle & Ramsden, 1983), the Approaches and Study Skills Inventory for Students (ASSIST) (Entwistle *et al.*, 2000), the Learning and Study Strategies Inventory (LASSI) (Weinstein & Palmer, 1990) and Study Process Questionnaire (SPQ) (Biggs, 1987) provide a measurement of surface and deep approaches of secondary and tertiary students. The deep and surface approaches are the building blocks of the Entwistle's model and Biggs's model of learning.

Entwistle (1987) proposed a heuristic model of the teaching-learning process in higher education that highlighted a relationship between student, teacher, and institutional procedures. The model proposes that student learning approaches and learning outcomes are influenced by students' previous knowledge, their level of intellectual ability and their learning motivation. The model focuses on the impact of the learning approaches on the difference in learning achievement. It points out that learning outcomes are the result of a complex interaction between learning, teaching and assessment.

Entwistle and Ramsden (1983) devised the Approaches to Studying Inventory (ASI) to identify four learning approaches: Meaning, Reproducing, Achieving, and Non-academic. They suggest that the meaning approach consists of the intrinsic motivation to learn and specific learning strategies of relating new ideas to previous knowledge and the use of evidence to form views. The reproducing approach consists of the extrinsic motivation to obtain a qualification and the use of rote memorization. The non-academic approach consists of disorganized study methods and negative attitudes toward learning (Entwistle, 1988). Student learning

approaches are influenced by various teaching approaches and subsequently influence learning outcomes. The model does not consider the exact relationship between individual student characteristics, teaching context and learning processes.

2.3 Biggs's 3P Model of Learning

Biggs's 3P model (1985, 1987, 1989, 1992, 1993a, 1993b, 1999) provides a theoretical framework of the relationships between the individual student characteristics, teaching context, learning approach and learning outcomes. Biggs (1979) suggested that students go about their studies for different reasons and that these reasons affect the way they go about their learning. Technically speaking, a student's motive for learning influences his/her strategy for learning. Students undertake the deep or surface learning approaches which are influenced by the corresponding motive and strategy at the tertiary level. The interaction between individual student characteristics and the content of the learning task influences the learning approach.

Considering the complexity of the teaching and learning context, a comprehensive framework is needed to examine a complex multi-faceted learning process. Biggs's 3P model (1993b, see chart 3) proposes that personal and situational factors influence a student to adopt a specific approach to learning which in turn influences the learning outcomes. The model, developed originally by Dunkin and Biddle (1974), shows classroom learning as a multi-variate integrated system consisting of variables in a series of stages entitled presage, process and product. These three sets of variables include (1) before the learning takes place, such as the learning environment and individual student characteristics (presage), (2) while learning is taking place; i.e. students' approach to learning (process) and (3) the learning outcomes after learning has taken place (product). The 3P model focuses on student motivation: what students tend to get out of a learning task affects the learning approach they adopt, which in turn influences the learning outcomes or academic achievement. For instance, presage variables such as personality characteristics affect a student's learning approach which directly influences learning outcomes. The model identifies the relationship between student personality characteristics, teaching environment, students' perceptions of the teaching context, students' learning approaches and learning outcomes.

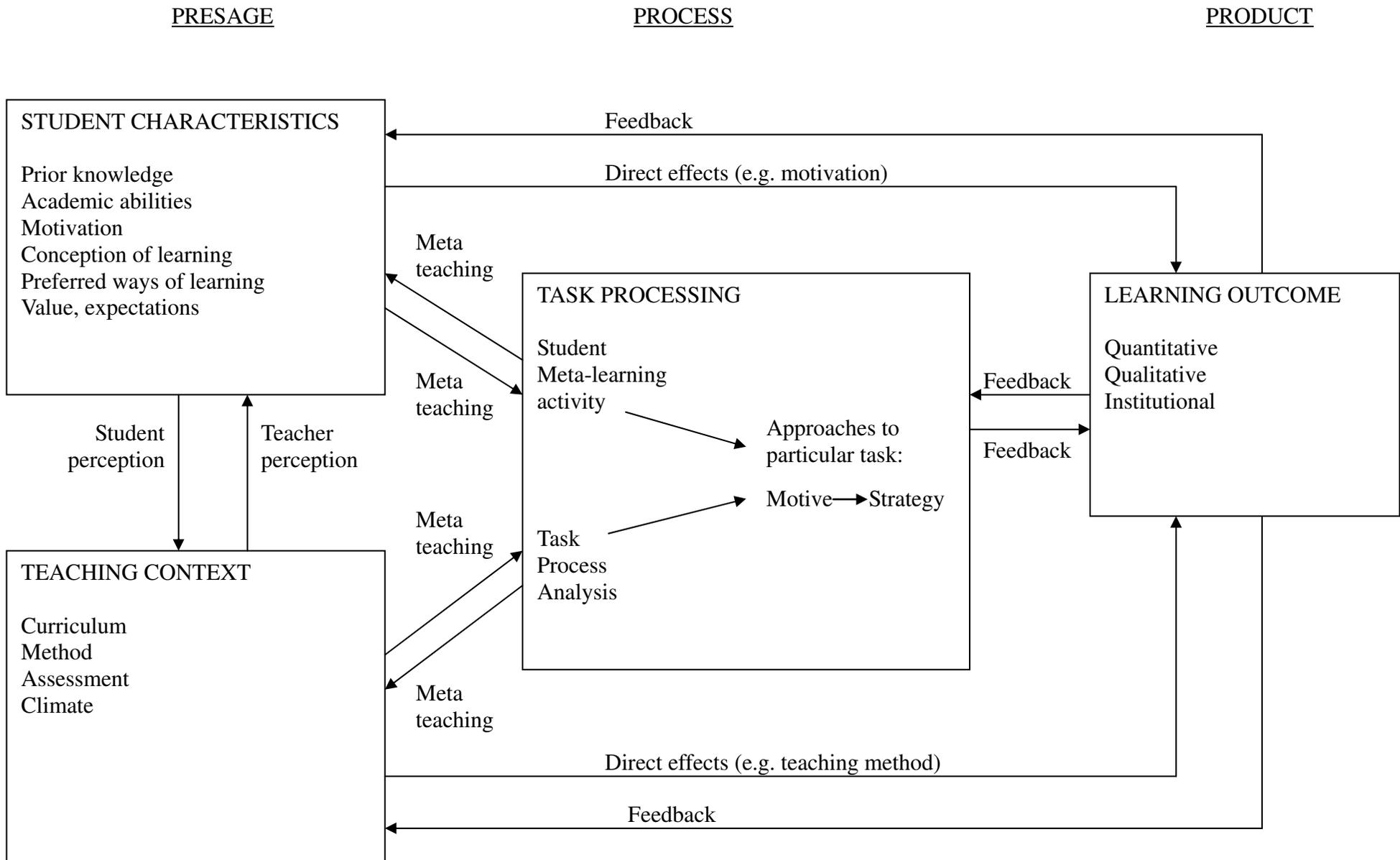


Chart 3: Biggs's 3P model of student learning (Biggs, 1993b)

It is assumed that tertiary students have developed stable learning motives and learning strategies as a result of their different personalities and perception of various learning environments. Presage components consist of individual student characteristics and teaching (presage) factors. First, the individual student characteristics brought to the learning situation include prior knowledge, academic standard and personality. Secondly, teaching presage factors include the teachers' personal characteristics together with institutional factors such as teaching methods, course assessment, workload and curriculum content. The presage factors such as students' perceptions of the learning environment might directly influence learning outcomes. The two kinds of presage factors affect each other to determine the learning approach. The interaction between individual student characteristics and the teaching context involves a meta-cognitive activity called "meta-learning" (Biggs, 1985) which means that students focus not only on the content of what is to be learned but also on how to go about the task.

Learning approaches are the process factors. The 3P model suggests that students' motives for learning and strategies for learning are combined to reflect learning approaches. The learning approach also reflects the interaction between individual student characteristics and the learning context. The 3P model's theoretical conception of learning approaches differs from other theorists in its two components: how students approach a learning task (strategy) and why they want to approach it in the first place (motive). Different motives are associated with various learning strategies, the two together generating a learning approach. The 3P model proposes three different learning approaches -- surface, deep and achieving approach.

The definition of the deep approach is based on the students' personal commitment to the learning process. The deep approach is concerned with striving for enhanced understanding by using and comparing concepts and ideas. The guiding principle of the deep approach is to maximize understanding to satisfy intrinsic interest by engaging with the learning tasks properly. Other characteristics of the deep approach include students' tendency to use meta-cognitive skills, to develop learning materials that generate new ideas, to provide other solutions from an inquisitive-critical perspective. The deep approach results from an inner need to

achieve a complete understanding of the learning materials. This approach is entirely task-oriented and is what most teachers would like to ask their students to adopt in their study.

The surface approach emphasizes the reproduction of knowledge with little attempt to integrate information (Biggs, 1993a, 1993b; Marton & Säljö, 1976a, 1976b; Thomas & Bain, 1984). Students using the surface approach tend to assimilate the learning materials without asking in-depth questions, study the material in a linear manner, deal with a problem without showing interest; and are concerned with the time required to complete the learning task. The surface approach often makes little use of meta-cognitive skills and is motivated by the student's need to avoid failure at school and the desire to minimize effort while finishing assigned learning tasks. For instance, the student wants to pass tests and assignments without exerting too much effort, so that there is the negative force of fear of the outcomes of failing. The goal is not to engage with the learning task optimally, but to achieve the extrinsic goal, so that learning tasks are seen as a chore to be got out of the way.

It appears to be commonly believed that rote learning is synonymous with the surface approach. That is not so; the guiding principle of the surface approach is extrinsic to the purpose of the task by investing minimal time and effort to meet requirements. Rote learning, however, may confer advantages in certain types of assessment environments. Evans *et al.* (2003) found that students who used the surface approach tended to emphasize superficial learning strategies and were reluctant to engage in reflection. These students learn materials in a less comprehensive way. Biggs (1993a, 1993b) argued that rote learning of selected facts, without understanding their meanings, is one of the common strategies used in the surface approach, but is not the only way. In some circumstances, rote learning may be appropriate. For example, public examinations or performing in a play, memorizing lines or already understood factors may be needed to achieve the goal which is considered to be the surface approach. It is argued that the learning environment and assessment methods would affect the student learning approach. Tang (1991) found evidence of such a strategy among Chinese students. Studies by Biggs (1993a, 1993b) and Salili (1995) suggested that students from the Chinese

and Japanese culture believed that a deep understanding is achieved through memorization and the surface approach may be acceptable in certain circumstances. Using the deep approach is time-consuming and some students might lack the time to be deep about everything they learn. For example, Lizzio *et al.* (2002) found a positive relationship between deep approach and academic achievement of commerce degree students, but this relationship was not present in science or humanities degree students. It is possible that memorization and rote rehearsal seem suitable for certain types of learning material or examination formats.

In the achieving approach, the learning involves both memorizing and understanding. Students using this approach are motivated to excel regardless of their interest. The approach is based on ego-enhancement by obtaining high grades which involve organizing time and workspace, seeking cues from teachers as to what is expected and prioritizing. The achieving approach might lead to either the deep or surface approach, depending on the students' perception of the learning environment, assessment methods or teaching context. If the assessment requires the testing of factual information, then the surface approach is used; if demonstration of deep understanding of the material is required, the deep approach is adopted. Although the learning approach may vary depending on the contextual demands, deep and surface approaches are mutually exclusive for learning tasks. For instance, if course grades are more likely to be based on assessments which are related to memorization or procedural knowledge, the surface approach may be used. Procedural knowledge is related to how to perform a particular task following a set of procedures (Turban *et al.*, 2005). For example, a method to balance a company financial report would be considered procedural knowledge. As Biggs (1999) pointed out: "Procedural knowledge on its own is skill-based, lacking the high-level declarative foundation; it is a matter of getting the sequences and actions right, knowing what to do when a given situation arises, having the right competencies (p.40)." The heart of the learning system is at the process level where the learning task constructs or does not construct the desired learning outcomes. As Shuell (1986) pointed out: "If students are to learn desired outcomes in a reasonably effective way, then the teacher's fundamental task is to motivate students to engage in learning activities that are likely to result in their achieving those outcomes. It is important to remember that what the student does is more important than what the

teacher does. (p.28)” The following figure shows a brief summary of the deep and surface approach which is adapted from Biggs (1987, p.11):

	Motive	Strategy
Surface Approach	<ul style="list-style-type: none"> - Surface motive is instrumental; - key purpose is to meet requirements minimally; - a balance between hard working and failure 	<ul style="list-style-type: none"> - Surface strategy is reproductive; - focus on selected details and accurate reproduction through rote-learning for assessments; -failure to distinguish principles from examples; - focus on discrete elements without integration; -unreflectiveness about purpose
Deep Approach	<ul style="list-style-type: none"> - Deep motive is intrinsic; - study to satisfy curiosity and actualize competence in academic subjects 	<ul style="list-style-type: none"> - Deep strategy is meaningful; - read widely; - examine the logic of the argument; - discuss and interrelate with previous relevant knowledge; - relate concepts to everyday experiences; - relate evidence

Figure 1: Deep and Surface Approach (Biggs, 1987)

How the student approaches a learning task depends on why he/she wants to approach it. The students' motives and their accompanying strategies combine to generate the deep approach and the surface approach. Academic achievement may be attributed to both learning context and student characteristics. Previous studies have typically revealed that the deep approach is positively associated with academic achievement and the surface approach is negatively correlated with academic achievement (Albaili, 1995; Cano, 2005; Diseth, 2003; Drew & Watkins, 1998; Entwistle & Ramsden, 1983; Entwistle *et al.*, 2000; Phan, 2006; Watkins,

2001; Wong & Watkins, 1998; Zeegers, 2001). On theoretical grounds, it was argued that students using the deep approach are often academically high achievers (Brown & Nelson, 1983; Bruch *et al.*, 1986; Entwistle & Wilson, 1977) and maintain feelings of great satisfaction (Biggs, 1984, 1985). Tooth *et al.* (1989) found a negative relationship between a surface approach and examination performance in first-year medical students. Lizzio *et al.* (2002) found a positive relationship between a deep approach and grade point averages among commerce students but such relationship was not present among science and humanities students. Sadler-Smith (1996), however, found a low correlation between scores on the deep approach and academic achievements in a study of business degree students in the UK.

The heart of the 3P model is at the process level where the learning approach produces or does not produce the expected academic outcomes. The quality and quantity of learning (product) is a function of presage variables (e.g. learning environment, prior academic performance, individual student characteristics) and process variables (e.g. learning approaches). The 3P model assumes that presage variables may have both a direct impact on product variables and an indirect impact via process variables. The learning outcomes which students achieve from the learning process are the product factors. The product factors can be described quantitatively (how much is learned), qualitatively (how well it is learned) and institutionally (grade point averages or accreditation).

In general, depth or accuracy of learning has been measured through assessment results such as grade point averages. It has been suggested that the relationship between successful learning outcomes and academic achievement necessarily reflects the quality of learning in terms of the understanding of concepts and use of knowledge (Watkins & Hattie, 1990). The surface approach is likely to recall unrelated detail, which leads to low grades; in contrast, the deep approach leads to structurally complex performances, which often lead to high grades. The students using the deep approach have an active conception of learning; those using the surface approach are likely to have a passive conception of learning. Students' learning approaches can be affected by the "grade point average perspective". Achieving high grades in assessment tasks are the major goal. Students may come

to perceive a struggle between learning and achieving good grades at the expense of understanding the material they learn. In other words, the process of assessment may have the unintended effect of inhibiting rather than facilitating learning.

2.4 Controversy associated with the 3P model

A number of arguments have been raised concerning the 3P model's assumptions and framework. First, there are differences of opinion about the relationship between learning approach and learning outcome. Biggs and Rhin (1984) argued that the relationship between learning approach and academic performance was very clear-cut. They stated that "a deep strategy, based on wide reading, relating new knowledge to what is already known, etc. results in better learning, whether better is defined as complexity of outcome, satisfaction with performance, self-rated performance in comparison with peers, or examination results" (p. 283). Some research findings, however, have not empirically supported this relationship (Beckwith, 1991; Trigwell & Prosser, 1991, Watkins, 1983; Zeegers, 2001). The difficulty may be partly due to the fact that a wide variety of research methods and student groups have generated conflicting results in empirical tests. The difference between emphasizing the quantity of what a student learns which is generally measured by grade point average and the quality of the material learned may be responsible for some of the differences in the empirical results. Research findings concerning the quality of the learning outcome, however, have also produced mixed results (Christensen *et al.*, 1991; Trigwell & Prosser, 1991). The use of different research methods, a wide range of academic majors, student background, cultural differences, and teaching context have yielded mixed empirical results.

The argument is essentially that students relying on the surface approach, rather than deep processing and understanding, may be able to obtain high academic results in their study. It is possible that students relying on the surface approach may confer advantages in certain types of assessment environments. For instance, some Hong Kong students rely on rote learning to memorize several key points which is based on a number of past examination papers in an attempt to pass the examinations. The examination-oriented entry selection results in the surface approach for many secondary school students in Hong Kong (Watkins & Biggs, 2001). Sadler-Smith (1996) found that there was a low correlation between scores

on the deep approach and academic results across twelve undergraduate units. Biggs (1987), Entwistle and Entwistle (1991) and Murray-Harvey (1993) reported that tertiary students' learning progress was affected by the learning approach in Australia and the deep approach was better than the surface approach as it tended to lead to a better quality of learning. Watkins & Biggs (1996) claimed that Chinese students who used the deep approach were more successful academically than those who used the surface approach. American research studies have found that students with high academic achievements were more likely to adopt the deep approach and successful students were better able to utilize the deep approach (McKeachie, 1988; Schmeck, 1988; Weinstein & Van Mater Stone, 1992). Trigwell & Prosser (1991) argued that it was important to encourage the deep learning approach to enhance the quality of learning together with an interactive teaching environment, clear goals and some independence in learning.

It is interesting to note that some students look for a pragmatic approach to achieve academic outcomes which can be a mixture of surface and deep approaches to learning. Their learning approach is a function of formats of assessment or public examinations in which different learning approaches are used for various subjects. For example, students may adopt the following strategies in their learning in an attempt to obtain higher possible results: (1) use previous examination papers to predict questions, (2) be alert to key points about the marking scheme, (3) memorise information needed for assessments, (4) focus on discrete elements with integration, (5) read widely and relate material to what is already known, and (6) orientate to understand and apply all relevant material. Given that one of the higher education missions is to encourage the deep approach, this researcher is of the view that there is a strong link between deep approach and academic achievement in Hong Kong Chinese sub-degree context.

Second, the 3P model does not provide a specific framework to describe student learning across various subjects. Biggs (1993a, 1993b) noted that the motive and strategy were related to the students' perceptions of the learning context. The learning approach which a student adopts for a particular course may be affected by a host of other factors such as the course curriculum, assessment methods, classroom climate, the teaching style, the workload, perception of interest in the

course and the task demands (Gibbs 1992; Ramsden 1987). For example, a student, who normally adopts the deep approach, may use the surface approach in a course that is overloaded with content and taught by a didactic method. Another student, who normally adopts the surface approach, may decide to go deep in a course with different course assessments.

At the individual learning task level, the learning approach used will depend on perceived interest, motivation, pressures from finishing tasks, contribution to the assessment and impact of the teaching and learning environment. The argument runs as follows. Students might switch their learning approaches in order to achieve superior academic results across different courses or assessment methods (Entwistle & Ramsden, 1983; Harper & Kember, 1986). Laurillard (1984) and Ramsden (1984) argued that some students might adopt the deep approach for one subject and the surface approach for another, which was related to the learning and teaching environment and to an individual student's perception of the subject. Biggs (1993a, 1993b) argued that only the deep approach was task-focused; the surface approach was more subject to learning contexts.

Gow *et al.* (1996) argued that learning approach was seen to be changeable to deal with different demands of the learning environment such as excessive workload, an emphasis on examination results, great time pressure and inadequate language proficiency, each of which could lead to the surface approach. It is argued that questionnaire responses may show the likelihood that a student will approach a learning task in a given way, but variables such as time stress, assessment methods, teaching context, learning environment or other contextual factors might influence students' pre-dispositions which affect their learning approaches.

Watkins and Hattie (1981) argued that first year and senior year students might use different learning approaches because senior year students were required to study advanced topics and needed to demonstrate critical thinking with a capacity for independent study. Biggs (1985) argued that the motives underlying the learning approaches arose from fairly stable personality characteristics and there is a relationship between locus of control and different learning strategies. The researcher is of the view that in tertiary education students' learning approaches are

relatively stable over time.

Fransson (1977) argued that 'perceived relevance' affects learning approach because students might perceive some subjects as being useful in their future careers and therefore adopted the deep approach. On the other hand, some students may perceive some other subjects as irrelevant to their future careers and therefore adopt the surface approach. Schmeck (1988) and Entwistle (1981) argued that students had a tendency to use the deep or surface approach which persists over situations. This means that a change in learning approach needs to be compatible with motivation, locus of control and other personality factors. Biggs (1987) explained that the consistency of learning approach across different learning situations can be viewed within the framework of the student's own meta-cognitive processes. The researcher is of the opinion that the consistency of learning approach across different subjects is stable in tertiary education because students' personality has been well developed and their perception of learning has been formed as tertiary learners. Most of the sub-degree programmes place greater attention on learning outcomes rather than examination results. 'Perceived relevance' may affect the learning approach since most Hong Kong students view education as a means of obtaining upward mobility and economic enhancement.

Third, the model does not clearly define the direction and strength of the relationship between learning approaches and individual student characteristics such as gender, study mode, their travel experiences, their work experiences and their extracurricular experiences. The model does not explain in a systemic manner the importance of variables such as study mode, age and gender to academic achievement. In terms of gender, the general national trend in the UK showed that women were more likely than men to obtain first-class or upper second-class honours degrees (Richardson & Woodley, 2003). Students' age and life experiences might affect their learning approach. Are mature students more prone to using the deep learning approach than young students? Is there a significant difference of learning approach between full-time and part-time students? Empirical results of applying the model to university students in Australia, Hong Kong, US and UK are mixed, partly due to differences in the context of the learning environment, learning culture and different subject areas (Marton & Säljö, 1997; Prosser & Millar 1989;

Trigwell & Prosser, 1991; Ramsden, 1992; Van Rossum & Schenk, 1984).

Fourth, the 3P model does not outline the possible differences in the theoretical relationship between individual student characteristics, learning approach and academic performance which involve primary, secondary and tertiary students. Biggs (1987) reported that “in both secondary and tertiary populations, it is possible to characterize students in terms of two dimensions only if desired: a surface approach and a deep approach” (p.18). The learning approaches of primary, secondary and tertiary students can be different due to their age, parental guidance, learning environment and other factors.

Other research findings may not adequately test the relationships of the 3P model, partly because the data used are cross-sectional. It is difficult to generalize the magnitude of the relationships between variables involving different types of tertiary students in terms of countries and different subject areas. There is little conclusive empirical support for the 3P model. This can be partly explained by the (1) diversity of research methods, (2) different statistical analyses used, (3) various subject groups ranging from primary to tertiary students, (4) cultural factors and (5) the teaching and learning environment.

To date, there has been little attention given to the learning approach of full-time and part-time Hong Kong Chinese sub-degree students. Although there are several concerns which have been articulated, the 3P model is directly related to higher education learning and provides a comprehensive conceptualization of student learning in higher education.

2.5 Theoretical Relationship between Age, Study Mode and Learning Approaches

The 3P model reveals that individual student characteristics (presage) have an impact on the learning approaches (process) and the learning approach affects academic achievement (product) (Albaili, 1997; Biggs, 1987; Sadler-Smith & Tsang, 1998; Watkins & Hattie, 1981; Watkins, 1998). Work on the inter-relationships between the three components in Biggs’s 3P model is extensive. The present study focuses on an examination of the relationship between age, gender, study mode,

locus of control, extracurricular activities (presage variables), learning approaches (process variable) and academic achievement (product variable). There is a great deal of research which has been conducted on individual differences and their impact on learning outcome including: the importance of prior domain knowledge (Hall & Edmondson, 1992; Royer *et al.*, 1993), gender (Gilligan, 1982; Sadler-Smith, 1996; Sadler-Smith & Tsang, 1998), interest (Hidi, 1990), locus of control (Wilhite, 1990) and motivation (Ainley, 1993; Ushioda, 1996; Weiner, 1979). Variations in learning approaches have been linked to different individual characteristics. However, there has been no empirical research to investigate this relationship in a systemic manner of full-time and part-time Hong Kong Chinese sub-degree students.

The definition of mature students is arbitrary and varies both within and across national systems of higher education. The US universities have recruited a substantial number of mature students since the mid-1970s. The proportion of so-called mature students refers to students who are over the age of 22 at the time of their entry into higher education. Traditional students are aged between 18 and 22 on entry (Lenz & Shaevitz, 1977). In Australia, mature students are over the age of 25 on entry (Hore, 1992). In the UK, students who are over the age of 21 on entry to undergraduate programmes are called mature students.

Richardson & King (1998) argued that a stereotype of older people is of a group who are deficient in intellectual skills which affect their academic achievement. There is no empirical evidence that mature students are subject to age-related deficits in intellectual ability for studying in higher education. Research studies comparing groups of different ages have revealed that there is a minor decline in intellectual function between the ages of 18 and 60 (Nyberg *et al.*, 1996, Verhaeghen & Salthouse, 1997). It is also argued that mature students are likely to have had a break from full-time education and to have lost some study skills. Although mature students may be effective problem solvers for their work and life demands, mature students may exhibit fewer learning skills for coping with an academic environment. Unlike younger students who proceed direct from secondary to tertiary study, mature students may feel that they need assistance in study skills.

There is a difference in the learning curve between mature and young students in terms of memory, mathematical skills and mental flexibility required to adapt to new perspectives. For example, increased work experiences might not compensate for the decline in mathematical and scientific skills due to a considerable break in study (Sanders, 1961). Research studies by Sear (1983) and Woodley (1984) found that older students tended to achieve slightly lower academic results than younger students in the old universities in the UK. Sanders (1961) found that the maturity associated with work experience and increasing age was directly correlated with academic success for some arts and social science courses.

In contrast, Brennan (1986) and Bourner and Hamed (1987) found that older students tended to do better than younger students in the polytechnics. Sadler-Smith & Tsang (1998) found that there were no age and gender differences in learning approaches for British and Hong Kong tertiary students. The argument of a difference in learning approaches between mature and younger students has been advanced from this premise. Mature students tend to have more to give up and are expected to be more intrinsically motivated than younger students. Older and experienced students are motivated by intrinsic motivation rather than by pragmatic considerations (Richardson, 1994; Watkins & Hattie, 1985; Wong, 1992). In other words, they are likely to be adept at examining and exploiting their prior experience in order to analyze new information and new situations. As Harper and Kember (1986) noted, “older students, rather than their younger counterparts, display those learning characteristics which traditionally higher education has purported to be striving to develop in students” (p.220). Younger and inexperienced students tend to adopt the surface approach (Aaron & Skakun, 1999).

There seems to be considerable agreement from a number of studies (Biggs, 1978; Harris & Brooks, 1998; McInnis *et al.*, 1995) that more mature students have a greater motivation and sense of purpose, greater satisfaction and adopt the deep approach. A wide variety of research methods and student groups have empirically supported this relationship (Biggs, 1985, 1987; Clennell, 1990; Harper & Kember, 1986; Watkins & Hattie, 1981). Richardson (1995), Sadler-Smith (1996), and Watkins & Hattie (1981) revealed that mature students scored significantly higher

on the deep approach than did younger student. Mature students may have learnt to evaluate evidence or relate ideas through their work experiences. Work experience also tends to provide them with experience of interacting with others.

Harper and Kember (1986) suggested that the reason why mature students are more likely than younger students to use the deep approach was that the system of teaching and examinations in secondary schools oriented students towards the surface approach in response to the public examinations which determine entry to university education. A similar position was stated by Marton and Säljö (1976a, 1976b): “While many students are apparently capable of using ‘deep’ or ‘surface’ strategies, it may be that the current demands of the examination system at school level are interpreted by them as requiring mainly the recall of factual information to the detriment of a deeper level of understanding (p.125)”. Richardson (2006) found that older students tend to adopt the deep approach compared with younger students in distance education. However, one limitation of these studies is that they did not differentiate students on the basis of study mode (i.e. full-time versus part-time) and ignored this as a possible predictor variable. These studies are only concerned with full-time students.

Most research into learning approaches has ignored study mode as an important factor. Many adults have traditionally had few chances for higher education due to the lack of provision in the past in Hong Kong. The diversity of mature students in terms of age, educational attainment and personal circumstances results in patterns of educational provision that is different from younger students who stay on in full time study. Fortunately now, part-time sub-degree programmes are providing an opportunity to extend education beyond the period of compulsory schooling. The average age of full-time students tends to be younger than that of part-time students because many part-time students are working adults. It raises the issue whether there is any evidence that mature students tend to employ the deep approach compared with younger students in Hong Kong. The relationship between study mode and learning approach has been less studied especially in the case of full-time and part-time Hong Kong Chinese sub-degree students. Mature students are defined as those over age of 23 who have had a gap since completing full-time education in the present study. The difference between full-time and part-time students by age,

work experience and previous education might affect the learning approaches. It seems reasonable to suggest that a difference between the learning motivations of full-part and part-time students might exist.

2.6 Theoretical Relationship between Gender and Learning Approaches

Male and female students may differ in their learning approaches in higher education. It is argued that the way in which female students show conceptions of knowledge and intellectual development are qualitatively different from those of male students (Belenky *et al.*, 1986; Clinchy & Zimmerman, 1982; Gilligan, 1982). A hypothesis has been placed concerning gender differences in learning approaches ever since women first obtained access to universities in Britain and North America during the latter half of the 19th Century. While gender has been revealed to be an important variable in relation to a wide range of social phenomena, it is only the recent studies in the case of learning approach in higher education that have taken gender into consideration.

Gender differences in learning approaches might emerge in particular academic or cultural contexts, with particular disciplines, curricula or programme structure, or on different assessment methods. In general, female students work harder, are better organized, spend more time on course work and are less distracted in the classroom than male students (Arnor *et al.*, 1999; Davies & Brember, 2001). The studies concerning gender differences in learning approaches are far from conclusive. Research studies by Stumpf and Jackson (1994), Herlitz *et al.* (1997) and Meinz and Salthouse (1998) found that men and women appear to perform at similar levels in learning contexts which require the retrieval of memory, but women seem to out-perform men in learning contexts requiring the acquisition of new information. Empirical results of gender differences in response to learning approaches in higher education are mixed (Clarke, 1986; Harper & Kember, 1986; Miller *et al.*, 1990, Richardson & King, 1991; Watkins, 1982). Some studies (Sadler-Smith, 1996; Sadler-Smith & Tsang, 1998; Watkins & Hattie, 1985) found significant group differences in response to both age and gender. Smith and Naylor (2001) found that women were more likely than men to be awarded good degrees in the UK. Male students scored higher than female students on the surface approach (Biggs, 1987). Female students scored higher than male students on the deep approach (Watkins &

Hattie, 1981).

Richardson and King (1991) found that there was no gender difference in learning approaches by using the Study Process Questionnaire (SPQ) and the Approaches to Study Inventory (ASI). Richardson (2006) found that gender had no effect on the students' academic performance in distance education. Few studies have explored the impact of gender and age on learning approaches in Hong Kong (Sadler-Smith & Tsang, 1998). It is generally recognised that learning approaches depend upon the learning context and assessment. Gender differences in learning approaches might emerge in various academic or cultural contexts. Each of these is open to discussion on what differentiates between male and female.

The research question of a gender comparison of learning approaches in higher education is motivated by impressions acquired by the researcher in the context of both part-time and full-time Hong Kong Chinese sub-degree students. Based on his experience of teaching and course administration over a period of nine years, he had gained the impression that male and female students adopted various learning approaches. In particular, female students seemed to be more concerned with the deep approach. The impression had been formed during the course of interactions with students such as lectures, tutorial groups and individual consultations. However, it is far from certain that such interpersonal classification demonstrates the objective gender differences in learning approaches or only an impression caused by a biased sample. The present study would explore this issue by using quantitative methods.

2.7 Theoretical Relationship between Locus of Control, Extracurricular Activities and Learning Approaches

Academic causal attributions refer to the ways in which students perceive and explain the reasons for their academic outcomes and have major influence on students' cognitive and achievement-related behaviour (Weiner, 1986). Weiner (1979) found that people who scored high on personality measures of achievement were more likely to attribute success to their own ability and effort and were more likely to attribute their failure to external factors. The term locus of control refers to a person's belief in relation to the placement of control over his or her life events

(Jonassen & Grabowski, 1993). It is believed that an individual student's locus of control belief shows his or her attitude and motivation for learning. An internal locus of control indicates that the student takes personal responsibility for his/her academic performance. An external locus of control refers to his/her belief of little personal control over his/her learning (Sinclair, 1991). Locus of control is one of the most researched constructs in the area of personality (Rotter, 1990). There have been various studies concerning locus of control and possible relationship with other variables (Betancourt & Weiner, 1982; Strickland, 1989).

Appreciation of responsibility is associated with better achievement outcomes. Findley & Cooper (1983) reported that low perceived control was associated with poor academic performance. Watkins (1984) argued that if students believed that they had control over their own learning, they were more likely to use the deep approach. Perceived lack of control is likely to lead to the belief of learning as a memory task. It is hypothesized that for students to want to adopt the deep approach requires confidence in their own academic ability and a conviction that they should not rely too much on the teacher but take responsibility for their own learning. It is predicted that an external locus of control is likely to be correlated with the surface approach.

The relationship between locus of control and academic achievement, however, is less clear. Watkins (1987) reported little relationship between locus of control and academic achievements among Australian college students. Research studies found that an internal locus of control is associated with better quality learning outcomes (Biggs, 1987; Ramanaiah *et al.*, 1975; Watkins, 1984; Watkins & Astilla, 1984). Ho *et al.* (1999) found that internal locus of control was more correlated with the deep approach, while external locus of control was related to the surface approach. The study implied that an ability to organize and plan learning approaches is important for academic outcomes. Biggs (1985) demonstrated that a student with an internal locus of control belief would use the deep approach more effectively than a student with an external locus of control belief. Kletzing (1982) and Wilhite (1990) demonstrated a positive relationship between internal locus of control and superior academic achievement.

Extracurricular experiences are activities performed by students that fall outside the realm of the normal curriculum of primary and secondary education. Such activities are generally voluntary and organised by student clubs or societies covering a wide range of sporting, social and cultural activities in Hong Kong. For example, many primary and secondary students participate in a soccer club, tennis club, drama club, singing club, photography club, chess club, debating society, etc. Students' experiences of extracurricular activities are considered as part of the individual student characteristics in presage variables of the 3P model. It appears that students who are more engaged in extracurricular activities are likely to have a better attitude towards learning, perform better academically, and enjoy an increased sense of accomplishment, competence, and self-esteem. It is argued that extracurricular experience enhances students' confidence in their ability which encourages the deep approach. This result is consistent with previous studies (Hattie *et al.*, 1997; Zhang, 2000). Extracurricular experience may influence students to adopt a deep learning motive in their learning tasks. Zhang (2000) suggested that extracurricular experience may enhance intrinsic motivation in learning. It is assumed that a student with a high level of extracurricular experience is more likely to use the deep approach.

2.8 Theoretical Relationship between Learning Approaches and Academic Achievement

A large amount of model development and empirical testing has been conducted on the relationship between learning approaches and academic achievement in tertiary education over the past two decades (Marton & Booth, 1997; Marton *et al.*, 1997; Prosser & Trigwell, 1999). What is the effect of students' learning approaches on academic achievement? Although the relationship between learning approaches and academic achievement is by no means straightforward, Biggs (1979) suggested that there is a positive relationship between deep approach and academic achievement.

The researcher is of the view that age, study mode, gender, locus of control and extracurricular activities appear to exert some combined effect upon the learning approach adopted. The study extends prior research as it is conducted with both full-time and part-time Hong Kong Chinese sub-degree students learning

environment, which is a remarkably under-researched context. The present study is concerned with (1) the relationship between individual student characteristics such as age, gender, study mode, locus of control and extracurricular activities and learning approaches; (2) the association between learning approach and academic achievement. There is a need to understand the relationship between individual student characteristics, learning approaches and academic achievement in higher education in order to enhance the effectiveness of student learning. Comparatively little is known about any differences in learning approaches between full-time and part-time sub-degree students in the Hong Kong context. These questions have important implications for Hong Kong sub-degree educators to enhance their course design and teaching practice for both full-time and part-time students.

2.9 Characteristics of Hong Kong Chinese Sub-degree Students

The pursuit of academic success is highly emphasized in Hong Kong. Education is viewed as an important means to a good job and economic prosperity (Llewellyn, *et al.*, 1982). Studies have shown that a greater emphasis on academic achievement was placed in Hong Kong than in the UK (Morris, 1983; Winter, 1990). It is often perceived that the predominant mode of teaching within secondary schools in Hong Kong uses a didactic method (Biggs, 1994). Class sizes typically are about forty pupils. Course curriculum and numerous public examinations are set by the education authority. Public examinations are taken very seriously, as entry to the government-funded universities is highly competitive so that progression from secondary school to university is restricted to elite students. There is considerable pressure to achieve a good result in public examinations to proceed to the higher education. The examination-oriented entry selection results in a didactic teaching and rote-learning approach for most secondary school students in Hong Kong (Watkins & Biggs, 2001). Associate degree and higher diploma programmes are often taken by students from less advantaged academic backgrounds who are not able to achieve sufficiently high grades in public examinations to obtain an offer on a full-time undergraduate programme at the local university.

Several research findings have reported that Hong Kong Chinese students tend to link the process of memorization and understanding to enhance learning (Biggs, 1994; Gow *et al.*, 1996; Kember & Gow, 1991; Marton *et al.*, 1996; Watkins &

Biggs, 1996). Students adopt a 'narrow orientation' by systematically working through material section by section, tending first to understand and then to memorize what they had learnt. Phan and Deo (2007) refer to this as 'institutionalization' of learning where students spot the tricks of effective learning by using a combination of memorization and rote learning in order to pass public examinations with good grades. Ausubel (1968) explained that the surface approach occurs since it is often required of students by the school and students are anxious and lack the confidence to adopt the deep approach. This is similar to the situation in the UK where Entwistle and Kozeki (1985) found that final-year secondary British pupils achieved high scores using the surface approach in response to the public examinations that determined their entry to degree study.

However, the empirical results of research on the learning characteristics of Hong Kong Chinese students in tertiary education are mixed. Students appear to be good at rote-learning and memorization and they are unwilling to think more deeply about their subject (Pratt *et al.*, 1999). Students are perceived as having a non-critical and non-analytical approach to learning. There is a common misconception that Hong Kong students always adopt rote learning and prefer passive forms of learning (Kember, 2000; Watkins *et al.*, 1991). Biggs (1989) reported that Hong Kong Chinese students achieved higher scores using the deep approach compared with their English speaking students at Hong Kong international schools. His studies revealed that curriculum design had a large impact on the learning approaches adopted by students in Hong Kong and that they are not inherently resistant to innovative teaching methods. Surprisingly, most degree students become increasingly surface and decreasingly deep in their learning approaches (Kember & Gow, 1991; Watkins & Hattie, 1985).

Research findings have shown that learning approach can be affected by cultural influences (Agarwal & Misra, 1986; Hau, 1992; Kember & Gow, 1991; Salili, 1993; Watkins & Biggs, 1996). Studies by Bond (1983), Hau (1992) and Watkins & Biggs (1996) have highlighted the importance of cultural factors on the learning approach of Hong Kong Chinese university students. The economic incentives encourage Hong Kong parents to place high value on higher education (Hau & Salili, 1991). High expectation of educational success is generated in Hong Kong's cultural

environment and school system.

Chinese students are serious in their view of the importance of working hard at their studies (Wu, 1996). Salili and Hau (1994) pointed out that Chinese students view effort and academic ability as closely related. Traditional Confucian philosophy emphasizes the importance of effort, hard work and endurance (Salili, 1996; Yang, 1986). In general, Chinese students are characterized by hard-work and high achievement motivation in an attempt to meet the goals set by the family or the peer groups (Salili, 1996; Stevenson & Lee, 1990). Salili and Mak (1988) found that the academic success of Hong Kong secondary school students was positively related to success in family and social life. In contrast, Murray (1938) studied Western high school students and found that their academic success was viewed as an individual accomplishment.

Chinese parents have placed much emphasis on a direct link between hard work and academic success. They are highly concerned about their children's academic achievement partly due to gain or loss of collective face and a path to higher social status and career development (Mordkowitz & Ginsburg, 1987; Stevenson & Lee, 1990). It appears that students feel obligated to work hard in school because of demands and expectations from their parents (Salili & Ching, 1992). Academic success is valued implicitly for social advancement and is viewed as a source of pride for the family (Ho, 1981). Although the Hong Kong educational system is being reformed in the Western context, the Confucian traditions still play a major role in public examination and conformity (Hayhoe *et al.*, 2001).

The influence of the Chinese culture is shown in Chinese students' attributions for their academic achievement. Academic success achieved by hard work is more valued than success gained through high academic ability. In view of academic failures, Chinese students rated effort as most important, followed by context, luck and academic ability (Chandler *et al.*, 1981; Yan & Gaier, 1994). Chinese students' attributions to internal and controllable causes such as effort and endurance are in line with the value emphasized in Confucian philosophy (Watkins & Biggs, 1996). American students perceive an inverse relationship between effort and academic ability and hard work is needed due to the lack of academic ability (Salili & Hau,

1994). Hong Kong Chinese students of elementary, secondary and tertiary sector rated effort and study skills as the most important factors for academic achievement (Hau & Salili, 1989; Hau, 1992). Chinese students believe that one can build up interest and develop study skills if they work hard (Hau, 1992).

Chinese students studied very hard to prepare for the examination for entry to the civil service which aimed to identify a small number of participants with a rounded education thousand years ago in China (Stevenson & Lee, 1996). The society has developed a respect for education which is very different from other societies. Many Hong Kong Chinese parents are willing to invest in education because of the value they place on education. This places pressure upon students to work hard and achieve academic success.

Numerous studies have revealed that Chinese students at home or abroad tend to have good academic results in international comparisons (Hsia, 1988; Stevenson & Lee 1996). Stevenson and Lee (1996) indicated that Chinese students were among the top-performers in international studies of mathematics and science. Salili *et al.* (2001) found that Hong Kong Chinese students and Canadian Chinese students generally worked harder and performed better academically than the European Canadian students because of the Confucian traditions. The different cultural backgrounds and various social contexts are needed to understand student learning.

Most of the sub-degree students originate from Hong Kong and have Cantonese as their first language. Most of the medium of instruction and assessment methods of sub-degree programmes are conducted in English in Hong Kong. One of the arguments noted that inadequate language proficiency might force students to use the surface approach in order to reproduce relevant information in English. Contrary to such perceptions, Biggs (1989) and Chan *et al.* (1991) found that Chinese students first translated the study materials from English into Chinese, studied the concepts in Chinese and then translated them back into English. Such process requires the characteristics of the deep approach. A mix of memorization and understanding to tackle learning tasks is one of the characteristics of Hong Kong Chinese students. Kember (2000) argued that the learning which involves memorizing and understanding is neither surface approach nor rote-learning. It is

believed that such a learning approach is part of the deep approach because students can understand the concepts or theories to suit some types of examination formats.

Samuelowicz (1987) found that over one-third of 145 lecturers at one Australian university felt that Asian students tended to use the surface approach in order to pass examinations. Asian students are more prone to rely on the surface approach than are western students. The anecdotes suggest that Hong Kong students rely on the surface approach and are more passive and less interactive in class than typical Western students (Kember & Gow, 1991). Dunbar (1988, p.12) noted that most of the Asian students were surface learners. "Learning is seen as possessing the ability to reproduce exactly what is taught in identical form. This "reproductive orientation" is manifested in rote memorization of facts, formulae, rules, tracts and schema. Unifying principles are usually overlooked, and an emphasis on details is encouraged. Learners are conditioned to accept and respect what the teacher presents as correct." However, Dunbar did not provide research evidence.

Biggs (1989) noted the comments from an external assessor at the University of Hong Kong: "... the students are said to be regurgitative with little insight and understanding of the subject in question, their answers close to what was taught, differences between better and poorer students being reflected in more effective recall than in qualitative factors (p.27)". Reid (1989, p.10) reported the reaction of an external examiner at the Hong Kong Polytechnic: "Students do better in questions requiring factual recollection and are weak in questions requiring reasoning and analysis."

Kember (2000) argued that a common perception that Hong Kong students rely upon rote learning and prefer passive forms of learning was not correct. If teachers believe such misconception and most students adopt the surface approach, teachers might adopt passive forms of teaching such as a didactic spoon-feeding approach which further encourages students to adopt the surface approach. If students perceive that the course assessment requires them to reproduce materials or emphasizes the superficial properties of the material to be learned, they are more likely to adopt the surface approach. Rote-learning design curriculum may affect the learning approach adopted by students.

Kember and Gow (1991) argued that Hong Kong tertiary students used both surface and deep approaches because there is a need to limit the amount of processing required when students are studying in a second language environment and culture attitudes related to Confucian perceptions to the respect of the teacher. Previous studies by Kember (1996), Kember and Gow (1990), Marton *et al.* (1997) proposed that some Hong Kong Chinese students used a “deep memorization” approach rather than a surface approach and rote learning. That is, while students are trying to memorize the learning materials, they are also trying to understand the readings, the working together of these two strategies facilitate students memorize better the materials.

2.10 The 3P model in the Context of Sub-degree Institutions

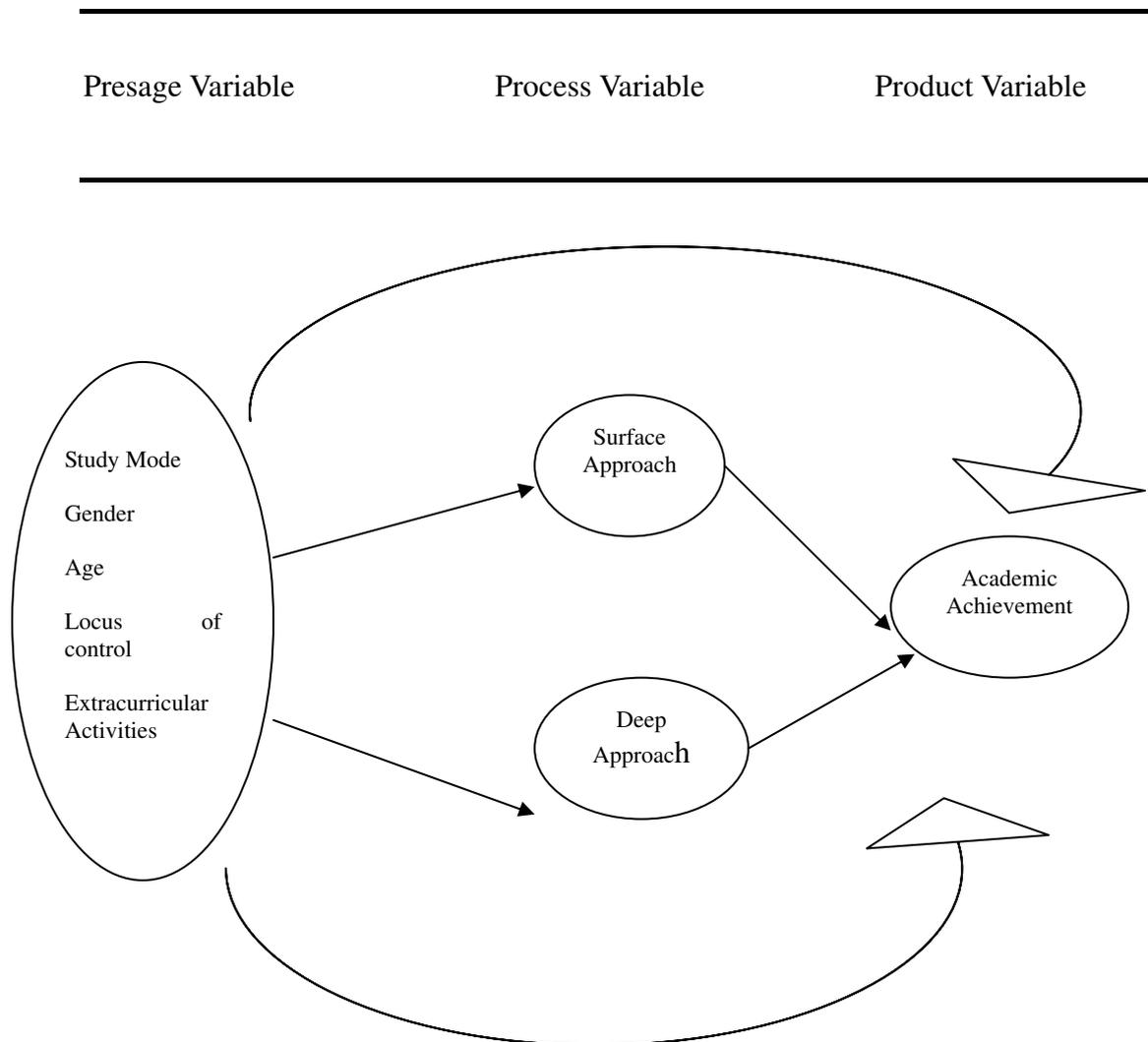
The 3P model serves as the conceptual framework for this empirical study in which the relationships between individual student characteristics, learning approaches and academic achievement of Hong Kong Chinese sub-degree students are examined. More of the “average” students have an opportunity to access higher education. Few studies have targeted the learning approaches of sub-degree students in Asian schools contexts. The researcher seeks to address the following questions.

- (1) Is there link between gender and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (2) Does study mode (full-time and part-time) affect learning approaches of Hong Kong Chinese sub-degree finance students?
- (3) Is there link between locus of control and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (4) Is there any relationship between extracurricular activities and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (5) Is there a positive relationship between deep approach and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (6) Do Hong Kong sub-degree students seek to adopt particular learning approaches?

- (7) Is there any relationship between gender and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (8) Is there any relationship between locus of control and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (9) Is there any relationship between gender, locus of control, extracurricular activities, learning approaches and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (10) Is there any relationship between gender, study mode, locus of control, extracurricular activities, learning approaches and academic achievement of Hong Kong Chinese sub-degree finance students?

The 3P model assumes that presage variables may have both a direct effect on product variables and an indirect effect via process variables. Watkins and Biggs (1996) found that the deep approach was associated with better academic performance among Hong Kong secondary school students. Zhang (2000) found a positive association between deep approach and academic performance for the US university students and a negative association between surface approach and academic performance for the Mainland China university students. The main focus of the present study is on the relationship between study mode, age, gender, locus of control, extracurricular activities, learning approaches and academic achievement because this may reveal information about factors which may be improved in order to achieve better academic achievement. To date, there is little research in the literature which addressed these issues. The present study tries to fill that gap and may have important implications at a time of rapid development of sub-degree education in Hong Kong. The following figure illustrates the 3P model of relationships between study mode, age, gender, locus of control, extracurricular activities, learning approaches, and academic achievement.

Figure 2. The theoretical relationships between study mode, age, gender, locus of control, extracurricular activities, learning approaches, and academic achievement.



Chapter 3 Research Design and Method

3.1 The Aims of the Study

Student learning and academic achievement in higher education have been researched from various perspectives over the past three decades (Biggs, 1987; Drew & Watkins, 1998; Entwistle & Kozeki, 1985; Hattie, 2008; Kember, 2000; Leung & Kember, 2003; Marton & Säljö, 1976a, 1976b; Prosser & Trigwell, 1999; Säljö, 1981; Schmeck & Grove, 1979; Thomas & Bain, 1984; Watkins, 1986). A number of studies have focused on the impact of individual differences such as age, locus of control, and self-concept on learning approach and academic achievement (Allen, 1992; Fuertes *et al.*, 1994; Kwok & Lytton, 1996, Sadler-Smith, 1996; Sadler-Smith & Tsang, 1998; Watkins & Hattie, 1985).

Research into the relationship between individual student characteristics and learning approaches has been conducted using both qualitative and quantitative methods. Qualitative studies (Marton & Säljö, 1976a, 1976b; Pask, 1976, 1988; Svensen, 1977) have emphasized the use of in-depth interviews and the subjective examination of learning approaches of a small number of students. Quantitative studies (Biggs, 1978, 1984, 1985; Drew & Watkins, 1998; Hattie, 2008; Phan, 2006; Schmeck & Grove, 1979; Schmeck *et al.*, 1991; Trigwell & Prosser, 1991) have generally focused on a statistical analysis of self-report questionnaires and retrospective examinations of the learning approaches of large groups of students. Entwistle and Hounsell (1979) argued that both qualitative and quantitative approaches to studying learning are complementary in nature.

This research attempts to investigate, using Biggs's 3P model, the relationship between individual student characteristics (presage), learning approaches (process) and academic achievement (product) using a quantitative approach. The 3P model provides a framework for putting together the key variables in the classroom to understand the way in which they may operate in relation to each other. The purpose of the present study is to identify the relationship between study mode, age, gender, locus of control, extra-curricular activities, learning approaches and academic achievement in a group of full-time and part-time Hong Kong Chinese sub-degree finance students.

The literature review which focuses on gender, age, study mode, locus of control, extra-curricular activities and learning approaches reveals that each of these variables is related to academic achievement. In the case of full-time and part-time Chinese sub-degree students, the relationships of these variables are unclear and there is little research to address these issues. The present study is intended to substantiate previous findings on these variables relating to Chinese students (Biggs, 1992; Drew & Watkins, 1998; Hau & Salili, 1990, 1991). The study focuses on full-time and part-time Hong Kong Chinese sub-degree students in order to extend Biggs's findings to a different population at a time of rapid development of sub-degree programmes in Hong Kong.

The present study is designed to achieve three objectives. First, the study is intended to examine the reliability and validity of the research instruments including the Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) and the Revised Causal Dimension Scale (CDSII) in the case of full-time and part-time Hong Kong Chinese sub-degree students. Second, it is intended to examine the relationship between study mode, age, gender, locus of control, extracurricular activities and learning approaches. Third, the study is intended to investigate the relationship between the learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree students. It is hypothesised that study mode, age, gender, locus of control and extracurricular activities account for a significant amount of variance in learning approaches. It is also proposed that there is a positive relationship between the deep approach and academic achievement for both part-time and full-time students. Comparisons of the learning approaches are made between part-time and full-time sub-degree students.

3.2 Statement of the Research Problem

The study aims to examine the relationship between study mode, age, gender, locus of control, extracurricular activities, learning approaches and academic achievement by using 3P model of full-time and part-time Hong Kong Chinese sub-degree finance students.

3.2.1 Main Research Questions

The main research questions are presented below.

- (1) Is there link between gender and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (2) Does study mode (full-time and part-time) affect learning approaches of Hong Kong Chinese sub-degree finance students?
- (3) Is there link between locus of control and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (4) Is there any relationship between extracurricular activities and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (5) Is there a positive relationship between deep approach and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (6) Do Hong Kong sub-degree students seek to adopt particular learning approaches?
- (7) Is there any relationship between gender and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (8) Is there any relationship between locus of control and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (9) Is there any relationship between gender, locus of control, extracurricular activities, learning approaches and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?
- (10) Is there any relationship between gender, age, locus of control, extracurricular activities, learning approaches and academic achievement of Hong Kong Chinese sub-degree finance students?

3.2.2 Specific Research Hypotheses

The following specific research hypotheses are formed based on the specific research questions.

1. There is a significant relationship between gender and the learning approach of

full-time and part-time Hong Kong Chinese sub-degree finance students.

2. There is a positive relationship between maturity (or age) and deep approach of Hong Kong Chinese sub-degree finance students. Mature students are more likely than younger students to adopt the deep approach.

3. There is a positive relationship between internal locus of control and deep approach of full-time and part-time Hong Kong Chinese sub-degree finance students.

4. There is a positive relationship between extracurricular activities and deep approach of full-time and part-time Hong Kong Chinese sub-degree finance students.

5. There is a positive relationship between deep approach and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.

6. There is a significant relationship between gender and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.

7. There is a positive relationship between internal locus of control and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.

Such questions are not just theoretically interesting, but also important for sub-degree educators seeking to understand the relationship between individual student characteristics, learning approaches and academic achievement in an attempt to enhance the teaching and learning process of Hong Kong Chinese sub-degree students. The research is needed to develop a deeper understanding of how students learn and how we can help them to learn more effectively if further improvement is to be achieved.

3.3 Significance of the Research

The present study stems from a number of factors which have important implications for the development of sub-degree programmes in Hong Kong. With the change from elite to mass tertiary education systems in Hong Kong over the past 20 years, considerable pressure has been placed on education institutions to enhance the quality of teaching and learning quality. One consequence of these changes has been a shift in emphasis in the approaches taken to teaching and learning in higher education. There is a pressing need to develop a greater understanding of students' learning approaches which is accepted by teachers in the sub-degree sector in order to enhance the effectiveness of student learning.

To date, little research has been conducted on full-time and part-time Hong Kong Chinese sub-degree students. The way students learn could depend on their individual student characteristics and their learning approaches. The findings of this research on the relationship between individual student characteristics and learning approaches could help toward building a learning model and improve the quality of student learning outcomes. No other research study has so far examined the 3P model to support the positive relationship between deep approach and academic achievement in the case of full-time and part-time Hong Kong Chinese sub-degree finance students. Through greater understanding of the relationships between learning approaches and academic achievement, educators may be better equipped to design teaching methods and assessment which improve students' learning outcomes. The study extends prior research as it is conducted in Hong Kong Chinese sub-degree finance students. It is hoped that the results of the present study may improve understanding of how these variables and learning approaches differ in the case of part-time and full-time students. It is believed that Hong Kong students are continuously pressured to compete academically and learning may serve different purposes. The findings have significant implications for sub-degree educators to help to enhance the learning environment and teaching context.

3.4 Research Paradigms: Positivism

Research paradigms are researchers' ways of looking at the world. It is generally accepted that positivism and interpretivism are the two major epistemological

paradigms in educational research. Positivism is a term adopted by social scientists to imply the application of the scientific method to the study of human behaviour. The paradigm regards knowledge as objective, hard and tangible. Giddens (1975) stated that the methodological procedures of the natural sciences may be directly applied to the social sciences and the end-product of investigations by the social scientist can be formulated in terms which parallel those of the natural sciences. Positivism states that the purpose of science is to look into what is observable and measurable. The goal of knowledge is to describe the phenomena experienced. It can be argued that we inhabit a coherent, uniform and relatively stable society which can be measured, understood, and generalized by scientific methods. In other words, there is an objective reality in the society. If the social world is observed well enough, it is able to predict and control (Punch, 2005). In positivists' thinking, a social reality exists and it is possible to establish sets of social facts to identify causality through empirical research.

Morrison (2002) discussed a number of features of positivism in educational research. People are the objects in research and the feelings of people such as students, teachers or principals are not taken into consideration. Only observable facts can be considered to be knowledge in positivist approaches to educational research. Deductive reasoning is employed in positivist approaches through the testing of hypotheses which are generated by theories. Hypotheses are seen as predictions or answers to specific research questions and play a key role in quantitative research.

The conceptual framework shows the conceptual status of the factors, variables or phenomena with which researchers are working. It is a representation of the main concepts or variables, and their presumed relationship with each other. The linking of concepts and data is made in a pre-figured quantitative research. The data obtained by the positivistic researcher can be viewed as objective, quantifiable, explanatory and replicable. Data analysis involves various statistical methods with large samples such as regression analysis. Context is controlled in quantitative research. Quantitative methods are relatively narrowly focused and outcome-oriented. The findings of quantitative research may be generalized to various circumstances.

The positivist researcher is concerned with the value of objectivity in research by employing statistical methods. Quantitative methods provide an opportunity to test large sample sizes and are easily standardized and offer statistically verifiable results. For example, close-ended surveys appear to be a feasible way to collect reliable data if participants are sensitive to specific questions relating to their image and their belief.

The present study employs the close-ended survey method and quantitative analysis. There are several advantages of using a close-ended survey in the present study. First, one of the objectives of the study is to empirically test the 3P model in the context of Hong Kong Chinese sub-degree students. The close-ended survey can obtain a sufficient sample size to run reliable statistical tests of the relationship predicted by the model. Second, in view of the large sample size, it may be possible to generalize the findings of the quantitative study to other sub-degree students in Hong Kong. Third, face-to-face interviews relating to learning approach and personality are sensitive for Hong Kong Chinese students who may not be willing to answer honestly. The close-ended survey is feasible to gather reliable data and appears to be broader in scope. Fourth, quantitative approaches provide empirically verifiable estimates of the magnitude of relationships between different variables in the model. Thomas and Bain (1984) note that “it has commonly been assumed that questionnaires are more suited to the measurement of learning styles, whereas interviews enable the contextual variability of learning to be detected” (p. 228).

The usefulness of the survey is dependent upon the degree of students’ awareness of their learning approach. However, Entwistle and Hounsell (1979) warned that the quantitative approach restricted consideration to a set of inventory items determined by the research and forced the students to report their learning approach which over-emphasizes the consistency of their learning behaviour. It is also argued by Thomas and Bain (1984) that over-emphasising the consistency of student learning approaches by using a self-reported survey cannot explain the possibility of a change in learning approaches in response to other external factors. The reliability of information obtained depends on participants’ ability to accurately report their evidence in questionnaires.

Other potential problems of a survey include unclear vocabulary, uncertain test directions and complex sentence structures. This researcher believes that weaknesses of a survey can be overcome. A pilot study can fine tune vocabulary, sentence structures, scoring methods to improve the reliability and validity of surveys.

3.4.1 Research Paradigms: Interpretivism

Interpretivists aim to find out the meaning of social events and people's experience. Cohen *et al.* (2000) and Punch (2005) argued that quantitative methods are not normally appropriate for studying an inner perspective of social events. Interpretivists view knowledge as personal, subjective and unique. Social reality is socially constructed and the subjective experience of individuals in the social world is important in which people understand reality in various ways (Burrell & Morgan, 1979). There cannot be an objective reality without considering the research subjects' perspectives. In contrast to positivism, the emphasis in interpretivism is upon research participants as research subjects rather than research objects. The focus has been on the subjective reality for individuals. Qualitative data entail gathering empirical information about the world in the form of observations, documents, diaries, or unstructured interviews which reveal deeply thought-provoking experiences, perceptions, and judgments of respondents such as personal feelings about good teaching performance.

The source of hypotheses and theories are developed inductively by using qualitative data. Data analysis primarily involves a descriptive and interpretive approach by organizing data into categories, identifying patterns and generating a descriptive narrative synthesis. Qualitative research examines the full context to develop a deep understanding or capture human perspectives. Quantitative research tends to use pre-specified questions, whereas qualitative research is likely to be more diverse. The qualitative approach can provide in-depth information about the individual. Rather than trying to make generalizations, qualitative studies are appealing because they provide a detailed understanding of the diversity and complexity of the individual. Bell (1993, p. 5) pointed out "Researchers adopting a qualitative perspective are more concerned to understand individuals' perceptions of

the world. They seek insight rather than statistical analysis”.

Middlewood *et al.* (1999, p.11) summarized the essential features of both positivism and interpretivism in the following table:

Positivism	Interpretivism
1. The world is external and objective	1. The world is socially constructed and subjective
2. The observer is independent	2. The observer is part of what is observed
3. Science is value free	3. Science is driven by human interests
4. The focus is on facts	4. The focus is on meanings
5. Search for causality	5. Try to understand what is happening
6. Reduce to simplest elements	6. Look at the totality of the situation
7. Formulating concepts measurement	7. Using multiple methods to establish different views of the phenomena
8. Large samples	8. Small samples looked at in depth or over time

The effectiveness of qualitative analysis depends on the quality of the method such as an interview. Validity and reliability of interviews are major considerations in assessing research outcomes. There are a number of issues which have to be considered. First, the subjectivity and possible bias of the interviewer might adversely affect the validity of the interview. Second, interviewing in some areas might invade privacy. Third, Punch (2005) stressed that the accuracy of an interviewee’s memories, dishonesty, self-deception, social desirability, correspondence between verbal responses and behaviour may also affect the validity of an interview. It is not easy to determine the trustworthiness of information or opinion by the interviewee; telling lies is part of the problem. The success of interviews can be influenced by the interviewer’s manner, encouragement and other external factors (Robotham, 2004; Sikes, 2000).

The artificiality of the interview situation may conceivably create artificial answers and descriptions. There remains a possibility that the respondents may

somehow be prompted by the interviewer or be affected in some other way by unintended aspects of the interviewer's behaviour. The process of behaviour confirmation in social interactions affects the validity of qualitative methods. The aspects of the researcher's behaviour may encourage the respondents to reply in a manner that confirms the researcher's own stereotypes (Snyder & Swann, 1978). This situation can be triggered by highly visible characteristics such as a person's age, gender or physical appearance and it helps to sustain social stereotypes that may be quite erroneous. These biases can be reduced by using standardized procedures, such as questionnaires, in a research context that do not depend on any close personal interaction between the researchers and the respondents. In qualitative research, subjective interpretation of the information is not easily avoided.

The relationship between the interviewee and interviewer such as teacher and students might generate pressure in interviews. Students may not be willing to express their learning experience because of the relationship between interviewer (teacher) and interviewee (student) in classrooms. For instance, students may not be willing to comment on their negative learning experiences in a teacher-student interview setting.

In this type of research on student learning, the usefulness of interviews is dependent upon the degree of students' awareness of their learning process which they may not be able to explain. The limitation of generalisability in conducting an in-depth study of a single case is another concern. Different assumptions and various background information are taken into consideration. Unlike quantitative methods, there are interactions between researchers and respondents which are necessary to explore the research questions. Numerous studies of learning approaches have used the interview-based methodology to categorize deep and surface approaches (Bowden, 1986; Marton, 1979; Marton & Säljö, 1976a, 1976b; Marton & Svensson, 1979) and quality of learning in secondary and tertiary students. However, the research procedures used in these studies are often not specific.

3.4.2 Research Approaches

Research approaches refer to the methodology that has been adopted to conduct the research which considers the conceptual framework and the design of research questions to select the appropriate research method. Studies of individual student characteristics, learning approaches and academic achievement have been conducted using either qualitative or quantitative approaches in various colleges or universities in different countries (Albaili, 1997; Beckwith, 1991; Biggs, 1987; Brennan, 1986; Byrne *et al.*, 2002; Cantwell & Moore, 1996; Chan *et al.*, 1991; Drew & Watkins, 1998; Hattie, 2008; Ho *et al.*, 1999; Phan, 2006; Sadler-Smith, 1996; Säljö, 1981; Schmeck & Grove, 1979; Watkins, 1986; Zhang, 2000). The present study focuses on a representative sub-degree institution to study the relationship between individual student characteristics, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students by using the quantitative approach.

3.4.3 Research Methods

Research into individual student characteristics and learning approaches has been conducted using both qualitative and quantitative methods. Qualitative studies (Pask, 1976, 1988; Marton & Säljö, 1976a, 1976b; Svensen, 1977) have emphasized the use of in-depth interviews and the subjective examination of learning approaches of small number of students. Qualitative research emphasizes the association between the individual construction of knowledge and what is imposed on the student from the outside world. Quantitative studies (Biggs, 1978, 1984, 1985; Entwistle, 1987; Schmeck, 1988) have generally focused on a statistical analysis of self-report questionnaires and retrospective examinations of the learning approaches of large groups of students.

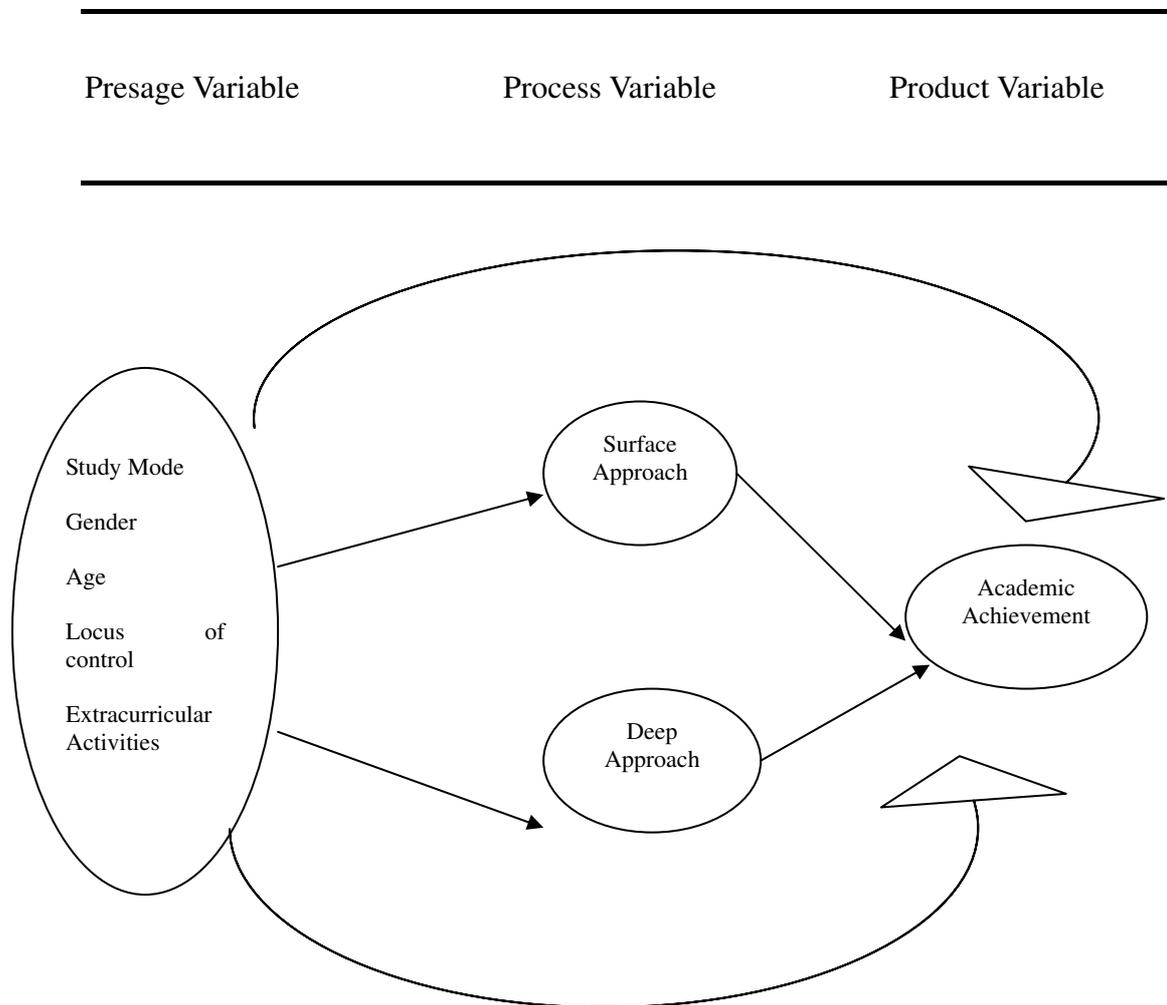
This study uses a quantitative approach from the positivist paradigm to empirically test Biggs's 3P model of the relationships between gender, age, locus of control, extracurricular activities, learning approaches, and academic achievement. A quantitative methodology is employed to empirically test the model because the focus of the study is on the relationships to explain how the variables are related with each other. The variables and hypotheses are developed and operationally

defined in this study to test theories by using sufficiently large samples in an attempt to answer specific research questions. The emphasis is on breadth rather than depth. The research questions are addressed through a survey method. Questionnaires are used to gather data on students' learning approaches. Academic achievement is measured by grade point average.

3.4.4 The Hypothesized Model

On the basis of Biggs's 3P model, a basic model is developed to describe the relationships between gender, age, study mode, locus of control, extracurricular activities, learning approaches and the academic achievement of Hong Kong Chinese sub-degree students. Figure 3 shows that gender, age, study mode, locus of control, and extracurricular activities are subsumed under the presage domain. The deep and surface approaches (learning process variables) are subsumed under the process domain. The GPA (learning outcome variable) is subsumed under the product domain. There is a path leading from gender, age, study mode, locus of control, and extracurricular activities to learning approaches. There are paths leading from both surface approach and deep approach to academic achievement. It is assumed that there is a negative relationship between surface approach and academic achievement and a positive relationship between deep approach and academic achievement. Regression analyses are conducted in order to determine the relationship between presage variables, process variables and product variable of both full-time and part-time Hong Kong Chinese sub-degree finance students.

Figure 3. The theoretical relationships between study mode, age, gender, locus of control, extracurricular activities, learning approaches, and academic achievement.



3.5 Research Instruments

Biggs's 3P model differs from other perspectives in the focus of its two domains: how students approach their learning task (strategy) and why they want to approach the task in a particular way (motive). Biggs (1987) assessed students' motives, strategies and approaches using a self-reported questionnaire, in which factor analysis generated three factors, each consisting of items that formed congruent motive-strategy combinations. His Study Process Questionnaire (SPQ) was designed for college and university students (Biggs, 1987). Students rate their usual way of learning on a Likert scale with items addressing surface, deep and achieving motives and strategies. Scores then represent pre-dispositions towards the various approaches (the combination of a motive and its corresponding strategy scores forms the corresponding approach). The Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) is used to evaluate the motives, strategies and learning approaches in this study because the R-SPQ-2F is constructed on the basis of Biggs's 3P model (Biggs *et al.*, 2001; Kember & Leung, 1998).

The original SPQ containing 36 items was developed within the theoretical framework of the 3P model (Biggs, 1987). Higher-order factor analysis of the original items generates three factors that comprised two kinds of factor, those corresponding to a motive and those corresponding to a congruent strategy. The three motives and three congruent strategies are classified as surface, deep, and achieving and a component motive and strategy score for each approach.

The SPQ was originally designed to assess the learning approaches of Australian and Canadian students and was subsequently used with Hong Kong students (Biggs, 1987, 1992). Biggs (1987) offered large statistical data on the SPQ from a representative sample of 2373 Australian university students. The study yields an internal consistency of the measure, with all dimensions generating an alpha coefficient of between 0.61 and 0.85. The deep learning approach illustrates the greatest consistency and the surface motive shows the least. Students' own estimates of their performance, their satisfaction with their performance and correlations with academic results are used as an evaluation of construct validity. The correlation coefficient for the relationship between surface approach and academic results is -0.15, and 0.2 for the relationship between deep approach and

academic results. All these figures are significant statistically.

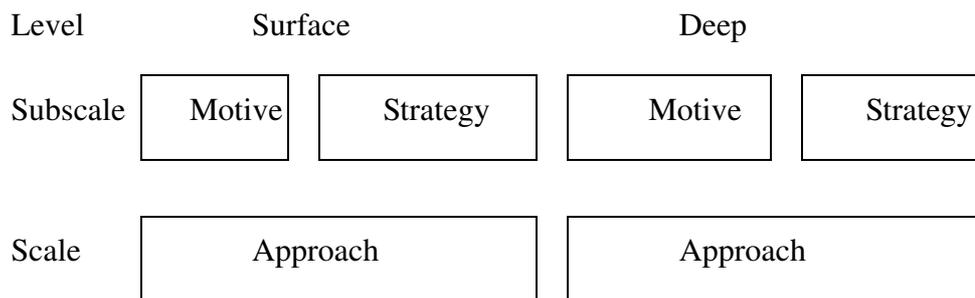
Biggs (1992) further reported that adequate reliability and within-construct validity of the SPQ had been determined by the test-retest reliability, internal consistency and LISREL estimates of dimensionality such as goodness-of-fit indices. The reliability and validity of the revised SPQ has been tested in studies of Hong Kong students' learning approaches (Biggs, 1992; Biggs & Watkins, 1995; Biggs *et al.*, 2001; Kember & Gow, 1991).

As there is a need for a shorter two-factor version of the SPQ to address deep and surface approaches only which could be administered easily for use in monitoring teaching and learning contexts, the R-SPQ-2F is formed and it has very good psychometric properties (Biggs *et al.*, 2001). Confirmatory factor analysis shows a good fit with the two-factor structure by using Hong Kong tertiary students. It found that tertiary students' learning approaches could be interpreted in a hierarchical structure which has two second-order factors including deep and surface learning. The R-SPQ-2F is considered a simpler scale to use in terms of reliability and validity to measure deep and surface approaches (Biggs *et al.*, 2001; Chan, 2007).

Each learning approach has two components. The first component is learning motive which means why students learn. The second component is learning strategy which means how students learn. With four sub-scales relating to two motives and two strategy factors, both deep and surface approach scales had well identified motive and strategy sub-scales: surface-motive, surface-strategy, deep-motive, deep-strategy. A total of 20 questions are presented in deep and surface motive and strategy scales each with 5 items, 10 items per approach score. Students are asked to identify if the statement is or is not like them. A five-point Likert scale from 'always true of me' which is anchored by 5 to 'only rarely true of me' which is anchored by 1 is used to solicit responses. The R-SPQ-2F has two main scales, Deep Approach (DA) and Surface Approach (SA) with four subscales, Deep Motive (DM), Deep Strategy (DS), Surface Motive (SM), and Surface Strategy (SS). From the 20 items, the deep approach (established from a deep strategy and deep motive subscales) and the surface approach (established from a surface strategy and surface

motive subscales) scores are obtained. High scores in each case reflect a greater tendency to use that particular learning approach. The full version of the R-SPQ-2F is provided in the appendix. English is the language of instruction at the school and there is no need to translate the questionnaires. The following chart shows the composition of the R-SPQ-2F scale and sub-scale scores.

Composition of the R-SPQ-2F scale and subscale scores



For instance, “My aim is to pass the course while doing as little work as possible” (surface motive), and “I only study seriously what’s given out in class or in the course outlines” (surface strategy). “I find that at times studying gives me a feeling of deep personal satisfaction” (deep motive), and “I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied” (deep strategy). Studies using this instrument provided reliability estimates ranging from 0.57 to 0.72 for the four subscales (Biggs *et al.*, 2001; Leung & Kember, 2003).

Items in a scale are put together in the questionnaire under the heading of the scale title as a means of enhancing understanding of the construct. A five-point Likert scale from ‘strongly agree’ to ‘strongly disagree’ is used to solicit responses. Permission to use the survey instrument is obtained from the relevant author. A number of studies have been implemented to operationalise the distinction between deep and surface approaches in terms of students’ response to various scales of questionnaires. Three research instruments have been employed to obtain results from students: the Study Processes Questionnaire (SPQ) (Biggs, 1978, 1985); the Inventory of Learning Processes (Schmeck *et al.*, 1977); and the Approaches to

Studying Inventory (Entwistle & Ramsden, 1983; Watkins & Regmi, 1996). The results from these questionnaires have been revealed to closely parallel the surface and deep approach identified by Marton and Säljö (1976a, 1976b) using a qualitative approach (Entwistle & Waterston, 1988).

There are several reasons for using the R-SPQ-2F in this study. First, the R-SPQ-2F is derived from the theoretical and empirical literature which defines the personal qualities considered to be important to academic learning which measures learning approaches in terms of sub-scales reflecting the student's motives and strategies on each of the two major dimensions. These motives and strategies have been examined in various contexts such as teaching and learning environments (Biggs, 1999), cross-cultural comparisons (Kember & Gow, 1990) and student characteristics (Watkins & Hattie, 1981).

Second, the psychometric properties of the SPQ scales have been assessed by different researchers (Albaili, 1995; Watkins, 1998; Zhang & Sternberg, 2000). It is reported that in many cases, the SPQ is a reliable and valid instrument for assessing students' learning approaches. Studies by Niles (1995) and Watkins & Dahlin (1997) supported the internal validity of the SPQ which is assessed through examining the internal structure of the instrument. The external validity of the SPQ is assessed through examining the SPQ against other instruments which are assumed to be based on similar constructs with the SPQ. It has been found that the SPQ assesses similar constructs as Entwistle's (1981) Approaches to Studying Inventory (Wilson *et al.*, 1996) and Cantwell and Moore's (1996) Strategic Flexibility Questionnaire.

Factor analysis of the SPQ and the Approaches to Studying Inventory by Kember and Gow (1990) showed that the two factorial structures were slightly different. Kember and Leung (1998) showed that the SPQ can be described in terms of two factors (deep and surface approaches) by using confirmatory factor analysis. Wong *et al.* (1996) tested six models of primary and secondary school SPQ data from Nigeria, Zimbabwe, Malaysia, China, Hong Kong and Canada and found that two-factor structures as having better model fit than three-factor models. Kember *et al.* (2004) tested the R-SPQ-2F and found that secondary school students' learning approaches could be interpreted in a hierarchical manner. The hierarchical structure

contains two second-order factors – deep and surface factors – with four sub-scales relating to two motive and two strategy factors. The overall hierarchical structure still maintains Biggs's (1987) original conceptualization of the motive and strategy factors of learning approaches. Biggs (1999) affirmed the abandonment of the achieving approach.

3.5.1 Academic Achievement

Grade point averages (GPA) of the whole programme scores for each student combine marks in the term-end examination (60%) and continuous assessment (20% assignments and 20% mid-term test). In general, questions on the term test and the final examination are structured to analyze rather than recall factual information. The course GPA is a weighted average of the GPAs for all compulsory subjects, which is measured on a scale from A (excellent) to F (fail), from the commencement of their study to the point at which the survey is conducted. These grades are converted to numbers for data analysis and higher numbers pointed to better grades (A = 5, B = 4, C = 3, D = 2, F = 1).

While it is argued that qualitative measures of learning outcomes may be better indicators of student learning, GPA in well designed assessments offers an appropriate measure (Prosser & Trigwell, 1999; Trigwell & Prosser, 1991). GPA is widely used as an index of students' academic ability. This index is also a predictor of students' general intelligence (Ridgell & Lounsbury, 2004). The high and low academic achievers are classified by GPA. Many studies have used GPA as the measure of learning outcome in investigating the relationship between learning approaches and academic performance (Byrne *et al.*, 2002; Trigwell & Prosser, 1991; Sadler-Smith, 1996).

3.5.2 Locus of Control

The Revised Causal Dimension Scale (CDSII) is used to measure the locus of control. The respondents decide on their perceived reasons for their academic success and failure in response to four various dimensions of causality which included locus of control, stability, personal control and external control using nine-point rating scales.

The traditional method to measure locus of control is for researchers to translate the respondents' perceived causes into dimensions. (McAuley *et al.*, 1992). Russell (1982) argued that a potential attribution research error was that the researcher perceived causes in the same way as the participants. Weiner argued that 'a basic error exhibited in attribution research is that the 'a priori' categorization of cause is accepted without considering the situation as perceived by the subject' (Weiner, 1983, p.535). The Revised CDSII was developed by McAuley *et al.* (1992) which the participant could directly indicate how he or she views underlying dimensions of their causes (Russell *et al.*, 1987). Confirmatory factor analyses are conducted to test the hypothesized factor structure and the results reported that the model fitted the data (McAuley *et al.*, 1992). Benson (1989) noted the advantage of the CDSII was that the respondents determined the dimensionality of the causes rather than researchers. Only the locus of causality scale is used for model testing in the present study.

3.6 Validity and Reliability

Validity is vital in all kinds of tests and measures. It is a matter of degree to which a test measures what it is supposed to measure in an intended content area and generate appropriate analysis from the data. Ambiguous test items, unclear vocabulary, complex sentence structures, inconsistent scoring methods, uncertain test directions and inappropriate data collection procedures may adversely affect the validity of surveys. A quantitative research study is concerned with external validity in which research findings can be usefully generalized to the wider population or to other similar cases.

The internal validity is tested through examining the internal structure of the instrument. Biggs *et al.* (2003) reported that the R-SPQ-2F was a reliable and valid instrument for assessing tertiary students' learning approaches. The external validity is obtained through examining the SPQ against other instruments assumed to be based on similar constructs with the SPQ. The SPQ assesses similar constructs as Entwistle's (1981) approaches to studying inventory (Wilson *et al.*, 1996) and Cantwell and Moore's (1996) Strategic Flexibility Questionnaire.

Reliability involves two main aspects: consistency over time and internal consistency (Punch, 2005). Data is reliable to the extent that there is consistency in the research conducted by different individuals over time. Sapsford and Evans (1984) emphasized that instrument design and testing were important in assessing the reliability of survey research because of the lack of direct interaction between researchers and respondents in self-administered surveys. Internal consistency deals with the reliability of a test at one time by using Cronbach's alpha (Cronbach, 1951). It measures the consistency of the items in a test and with the test as a whole. Items are internally consistent when its items are measuring similar things. Cronbach's alpha deals with the internal consistency of tests for multiple scored items such as Likert scales. Relevant statistical tests are conducted to ensure reliability of research instruments and the results are discussed in the next chapter.

3.7 Student Sample

There are various higher diploma and associate degree offered by government-funded universities in Hong Kong with different fields. Each of the programmes consists of a different programme structure, curriculum, assessment, field trips, teaching hours and summer internship. Learning experiences across different institutions and disciplines may be very different. In the light of findings that learning approaches vary as a function of fields, year of study, assessment methods and learning environment, the present study uses a more homogeneous sample of students by limiting the sample to the final year sub-degree finance students. This procedure allowed for a comparison of findings between full-time and part-time students. It may also prevent the potentially confounding effects of gender and age differences between different academic disciplines.

Accidental sampling is used in the present study. Accidental sampling is a type of non-probability sampling in which samples are chosen because they are readily available. Non-probability sampling means that the probability of selection is not known (Punch, 2005). Although homogeneous samples from one college may limit generalisability beyond final year sub-degree students, statistical analysis can be conducted to compare the difference between full-time and part-time students in terms of their presage variables in this study.

HKU SPACE serves as a representative model in Hong Kong because it is the first and largest institution in Hong Kong to offer higher diplomas and associate degrees in Hong Kong since 2000. The full-time student population was larger than 5,000 in 2006 with the large majority of students coming directly from secondary schools in Hong Kong (Chiu & Cunich, 2008). The full-time students are highly uniform in relation to their education background and age, with most students starting their course in the age range of 18 to 20. The full-time students are not campus residents, as the college does not provide halls of residence at the time of the study so that most of the students live in the family home. English is used as the medium of instruction in the community college and most of students' home language is Cantonese.

Higher diploma programmes, at sub-degree level, are normally taken by students who cannot achieve sufficient grades to gain admission to government-funded university programmes. The average age of full-time students tends to be younger than that of part-time students because all part-time students are working adults. All part-time courses are taught in classes in the evening. The higher diploma programme requires part-time students to attend three evening classes per week with three hours' duration. Full-time students are required to attend seven day-time classes per week, each of three hours' duration. In the past, few adults have had an opportunity to continue in post-secondary education because of the lack of provision. Others were unable to obtain entry to a government-funded university because of the limited number of places and the high level of formal qualifications needed for entry. Continuing education is providing an opportunity to extend the education beyond the period of compulsory schooling for those who did not have that chance.

This study is conducted with 3 cohorts of full-time and part-time students on the higher diploma in finance programme at HKU SPACE. The higher diploma in finance is one of the major programmes with a large number of full-time and part-time students to facilitate a comparison of full-time and part-time students in the study. The total number of full-time and part-time higher diploma in finance is 139 and 140 respectively. The sample size is 131 full-time students and 130 part-time students respectively in this study. All the full-time students are in their

late teens or early twenties; all the part-time students are working adult and their average age is 28. The students originate from Hong Kong and have Cantonese as their first language.

3.7.1 Pilot Study

Prior to questionnaire data collection, a preliminary version of the questionnaire was tested on a small sample of students in order to check and eliminate possible ambiguous item formulation. The pilot test was conducted in March 2007. The questionnaire was administered during week 11 of the 12-week teaching programme. The purpose of this pilot study is to confirm that the questionnaires used in the study are clear, precise, understandable and appropriate for Hong Kong Chinese sub-degree students. 10 full-time and 10 part-time higher diploma student volunteers were selected. Students were made aware of the objectives of the questionnaires. The pilot surveys were conducted by the researcher. All students were from Hong Kong and had Cantonese as a first language.

The researcher's room was not used to conduct the survey as some students may have found this intimidating. Questionnaires were given out to students after their classes. Post-questionnaire interviews were conducted in order to gather feedback from students in relation to the instruments. Most of the students, however, did not believe that there was a particular relationship between deep approach and academic achievement. They found that the outcomes of the process of teaching and learning in their secondary school were judged by whether students were able to pass the public examinations. Some of them noted that it might be easier to pass the examinations by using the surface approach because the coverage of the examinations was too large. It is not uncommon for students to focus on particular parts of their subjects in order to pass examinations in Hong Kong (Pratt *et al.*, 1999).

The interview revealed that the students' learning approach was dependent upon a host of factors such as teaching and assessment methods, classroom climate, peer group study and application of knowledge. A number of students found that they were only likely to use the deep approach in courses in which they were interested. They used the surface approach in their secondary school because students were

driven by the Hong Kong public examinations, with teachers drilling students to perform well in the examinations.

One additional finding warrants comment. A number of male students highlighted that career planning and development is a major reason to adopt the deep approach in this programme. They thought that there might be a relationship between deep approach and skills development. Kemp and Seagraves (1995) argued that the development of transferable skills rather than academic achievement was a core value in higher education.

Some students in the post-questionnaire interview suggested that some items in the study process questionnaire were not clear. For example, the no.2 item that read “I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied”; no. 5 item that read “I feel that virtually any topic can be highly interesting once I get into it” and no. 10 item that read “I test myself on important topics until I understand them completely”. First, students noted that both a surface and deep learning approach could be applied to no. 2 item if students aim to achieve high grades in the public exams. Second, students did not understand the linkage of learning approach and the meaning of the no. 5 item. Third, students noted that the wording of ‘important topics’ was misleading because students who adopted the surface approach might test themselves on important topics in order to pass the examinations. Some of them suggested that the adjective ‘important’ might be replaced by ‘different’ or ‘every’. It was found that some wording in the R-SPQ-2F might be unclear for sub-degree students. Some sentences in the instruments could be modified for community college students. Overall, students were able to understand the meaning of both instruments.

The possibility of the SPQ scores being affected by whether or not a student’s name was required was examined by Biggs (Kember & Gow, 1991). The SPQ was used by two randomly selected groups of students from the university in Hong Kong. One group was asked to provide their name. The other group finished the SPQ anonymously. No significant differences were found between the two groups on both SPQ means and factor structures.

3.7.2 The Administration of the Survey Questionnaire

The questionnaires were administered to all of the final-year students on full- and part-time programmes. The survey package included a covering letter to students explaining the purpose of the questionnaire. Participation by the students was voluntary and no remuneration was offered. Students were informed that they could leave without risks of penalty and the data would not be used for individual assessment purposes. All students were provided with access to their individual scores on request. Administrators handed out the questionnaire and covering letter about the research and gave assurances regarding the confidentiality of all data collected from students.

Students completed their questionnaires in class time because it is well known that there is a predictably low level of return of questionnaires when students take them away to complete. The students' number, age and gender were recorded in the first part of the questionnaire so that results could be matched. Questionnaires were only distributed to students who attended the lecture, rather than to all enrolled students. Responses to the questionnaire items were achieved by ticking responses to a five-point scale on a separate sheet. The student's number was requested in order to compare their responses with their GPA scores. Students handed the questionnaires back to the staff member for forwarding to the researcher. The usable questionnaires were completed and returned by 131 full-time students and 130 part-time students, which constituted an overall response rate of 94% and 93% respectively, a rate which was very high for this type of survey. The high response rate also minimizes the possibility of sampling bias.

3.8 Delimitations

1. The population of this study is restricted geographically to Hong Kong.
2. Data collected during the study is limited to one of the higher education institutions.
3. Data is collected from both part-time and full-time higher diploma in finance programmes.
4. The data is gathered by a questionnaire which was conducted in the classroom during the 2007/08 academic year.

5. It is not the intention of this study to examine the whole 3P model; nor is it the intention of the study to investigate the teaching approach in regard to students' academic performance.

6. It is not the intention of this study to examine how school administrators, teachers, parents or the community may influence the learning approach of students.

3.8.1 Assumptions

1. There is a positive relationship between deep approach and academic achievement of both full-time and part-time Hong Kong Chinese sub-degree finance students.

2. Part-time mature students are more likely to adopt the deep approach than full-time students.

3. Gender could play an important role in the learning approach used by students.

4. There is a positive relationship between internal locus of control and deep approach of both full-time and part-time Hong Kong Chinese sub-degree finance students.

5. There is a positive link between extracurricular experience and deep approach of both full-time and part-time Hong Kong Chinese sub-degree finance students.

3.9 Ethical Issues

Students were briefed about the research with assurance of confidentiality. Before completing the questionnaire, the purpose of the study was verbally explained to the students and they were reassured that their responses would only be used for research purposes and would not be used in any way in connection with their academic assessment. Students were informed that they could leave without risk of penalty and that they would have access to the findings of the study. Examination results were acquired with the students' consent.

In the present study, in which the researcher is one of the administrative staff in the college, it is perceived that qualitative approaches might be shaped by the

perspective of the researcher and the context within which he is working implicitly or explicitly. Quantitative methods might reduce the severity of this concern that a researcher is objective and politically unbiased.

3.10 Conclusion

This research uses the quantitative approach from the positivist paradigm to empirically test Biggs's 3P model of the relationships between age, gender, locus of control, extracurricular activities, learning approaches, and academic achievement in the case of full-time and part-time Hong Kong Chinese sub-degree finance students. A quantitative method is employed to test the model because the focus of the study is on the relationships to explain how the variables are related to each other. Biggs's 3P model assumes that tertiary students have developed stable learning motives and learning strategies as a result of having a different personality and perception to various learning environments. This assumption underpins the use of the close-ended survey for assessing student learning approaches.

Chapter 4 Data Analysis

4.1 Introduction

The 3P model provides a framework for putting together the key presage, process and product variables in the classroom to understand the way they may operate in relation to each other. The main focus of the present study is on the relationship between age, study mode, gender, locus of control, extracurricular activities (presage variables), learning approaches (process variables) and academic achievement (product variable) because this may reveal information about factors which may need to be improved in order to achieve better academic achievement. The present study is intended to focus on both full-time and part-time Hong Kong Chinese sub-degree finance students in order to extend Biggs's findings to a different population. The present study is designed to achieve three objectives. First, the study is intended to examine the reliability and validity of the research instruments in a sample of both full-time and part-time Hong Kong Chinese sub-degree finance students. Second, the study is designed to explore the relationship between individual student characteristics such as age, gender, locus of control, study mode, extracurricular activities and learning approaches. Third, it is intended to examine the relationship between learning approaches and academic achievement. Study one focuses on the relationship between student characteristics and learning approaches. Study two explores the link between learning approaches and academic achievement.

A quantitative method is employed to empirically test the 3P model because the objective of the study is to explain how the variables are related with each other. The variables and hypothesis are developed and operationally defined to test theories by using a sample size of 130 part-time students and 131 full-time students. Academic achievement is measured by grade point average (GPA). The survey instrument measuring locus of control is the Revised Causal Dimension Scale (CDSII) (McAuley *et al.*, 1992). The Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) is used to identify learning approaches (Biggs *et al.*, 2001).

Means, standard deviations, chi-square analyses and regression analyses are

calculated using the Stata computer programme. Regression analysis is used to examine the relationship between age, gender, locus of control, extracurricular activities, learning approaches and academic achievement. It is assumed that there is a linear correlation between presage variables, process variable and process variable. Regression analysis may not be able to confirm causation in a model because many models may also be consistent with a given dataset. The direction of causation is not always clear. For example, working out whether deploying more policemen reduces crime is confused by the fact that more policemen are allocated to areas with higher crime rates. On statistical grounds it is noted that regression analysis deals with correlation, not causation of variables.

4.2 Descriptive Statistics

There is a potential population of 140 part-time students and 139 full-time students. Completed questionnaires are collected from 130 part-time students and 131 full-time students, resulting in a response rate of 93% and 94%. Table 1 illustrates the sample analyzed by gender and study mode.

Table 1: Sample by gender and study mode

	Full-time	Part-time
Male	64	50
Female	67	80
Total	131	130

The means and standard deviations of the sample's scores of full-time and part-time students are presented respectively in Table 2 & 3. The deep approach (mean = 30.41, SD = 5.88) of full-time students has a higher mean value than the surface approach (mean = 28.30, SD = 5.53), as might be expected in the higher education students.

Table 2: Descriptive Statistics of Full-time Students

	Mean	Standard Deviation (SD)
Deep Motive	15.01	3.07
Deep Strategy	15.40	3.33
Deep Approach	30.41	5.88
Surface Motive	13.18	3.48
Surface Strategy	15.12	2.98
Surface Approach	28.30	5.53

Table 3: Descriptive Statistics of Part-time Students

	Mean	Standard Deviation (SD)
Deep Motive	17.52	3.04
Deep Strategy	16.85	3.43
Deep Approach	34.37	5.89
Surface Motive	13.05	3.37
Surface Strategy	14.76	3.42
Surface Approach	27.81	5.90

The R-SPQ-2F mean scores have no absolute meaning but can be used for group analysis and correlation with other variables. The deep approach is more widespread among full-time and part-time sub-degree students. The deep approach (mean = 34.37, SD = 5.89) of part-time students has a higher mean value than the surface approach (mean = 27.81, SD = 5.90). Overall, the part-time students have higher scores on the deep approach scales and lower scores on the surface approach scales than full-time students.

4.3 Reliability of Research Instruments

4.3.1 Learning Approaches

The reliability of the research instrument refers to the consistency of results and replicability. An independent researcher using the same raw data would generate the same analysis and the same results. The reliability, in terms of internal consistency, of the R-SPQ-2F scales and subscales is determined by using Cronbach alpha coefficient (Cronbach, 1951). The alpha value estimates the degree of internal

consistency of a subscale by comparing the variance of the respondents' scores on the relevant subscale with the variance of their responses to its constituent items. The results are reported in Table 4 & 5. The alpha values of the surface approach are 0.73 and 0.75 for full-time students and part-time students respectively; the alpha values of the deep approach are 0.76 and 0.78 for full-time students and part-time students respectively.

The range of alpha values are 0.60 – 0.76 and 0.60 – 0.78 of the subscales of the R-SPQ-2F for full-time students and part-time students respectively. Although some of the alpha values with the exception of the surface and deep approaches are lower than the common cut-off point of 0.7, the figures are still acceptable, as argued by Schmitt (1996). The alpha coefficients for the surface and deep approaches of both full-time and part-time students are in a range of 0.73 and 0.78. The reported alpha values for the surface and deep approaches of studies by Albaili (1995), Biggs *et al.* (2001), Chan (2007) and Leung and Kember (2003) supporting the validity and reliability of the scales are similar to the reported figures of the present study. The scales of R-SPQ-2F used in this study with the sample are considered to be reliable. In this study only the surface and deep approaches are included in the model to be tested.

Table 4: R-SPQ-2F Scales and Subscales: Alpha Coefficients (Full-time students)

<u>R-SPQ-2F Scale</u>	<u>Alpha Coefficients</u>
Surface	0.73
Deep	0.76
<u>R-SPQ-2F Scale</u>	<u>Alpha Coefficients</u>
Surface motive	0.61
Surface strategy	0.63
Deep motive	0.60
Deep strategy	0.66

Table 5: R-SPQ-2F Scales and Subscales: Alpha Coefficients (Part-time students)

<u>R-SPQ-2F Scale</u>	<u>Alpha Coefficients</u>
Surface	0.75
Deep	0.78

<u>R-SPQ-2F Scale</u>	<u>Alpha Coefficients</u>
Surface motive	0.60
Surface strategy	0.62
Deep motive	0.62
Deep strategy	0.69

The validity of the research instrument indicates how well the instrument measures what it is trying to measure. The validity is obtained through examining the SPQ against other instruments with similar constructs with the SPQ. Studies by Cantwell and Moore (1998), Kember & Gow (1990), Wilson *et al.* (1996), Zhang (2003) and Zhang and Sternberg (2000) showed that the SPQ assesses similar constructs as Approaches to the Studying Inventory (Entwistle, 1981) and the Strategic Flexibility Questionnaire (Cantwell & Moore, 1996). The psychometric properties of the scales are similar to the findings in the literature supporting the validity and reliability of the scales in this study (Biggs *et al.*, 2001, Chan, 2007).

4.3.2 Locus of Control

The alpha values of the four dimensions of the CDSII are 0.69 & 0.71 for locus of causality, 0.72 & 0.68 for personal control, 0.73 & 0.75 for stability and 0.66 & 0.69 for external control of full-time students and part-time students respectively. These alpha values are comparable to the reliability results by McAuley *et al.* (1992). These are considered sufficiently high to allow further statistical analyses.

4.4 Study One

Study one investigates quantitatively whether there is an association between the presage variables such as age, gender, study mode, locus of control, extracurricular activities and the process variable (learning approaches) of both full-time and

part-time sub-degree students. Watkins (1984) argued that if students believe that they have control over their own learning, they are more likely to use the deep approach. It is hypothesized that for students to want to adopt the deep approach requires confidence in their own academic ability and a conviction that they should not rely too much on the teacher but take responsibility for their own learning. It is predicted that an external locus of control is correlated with the surface approach.

Gender differences in learning approaches have emerged in particular teaching and learning environment and cultural contexts. For example, female students scored higher than male students on a deep approach in the UK (Watkins & Hattie, 1981). It is hypothesized that gender differences are associated with a particular learning approach. The differences between full-part and part-time students by age, work experience and previous education might affect the learning approaches. It seems reasonable to assume that a difference might exist between the learning motivation of full-time and part-time students. The relationship between study mode and learning approach has been less studied. Extracurricular experience may enhance students' confidence and affect their learning motivation. It is assumed that a higher level of extra-curricular experience is associated with the deep approach. The specific research questions in this study that are examined are presented below.

4.4.1 Specific Research Questions

1. Is there link between gender and learning approaches of full-time and part-time Hong Kong Chinese sub-degree finance students?
2. What is the relationship between study mode, age and learning approaches of full-time and part-time Hong Kong Chinese sub-degree finance students?
3. Is there link between locus of control and learning approaches of full-time and part-time Hong Kong Chinese sub-degree finance students?
4. What is the relationship between extracurricular activities and learning approaches of full-time and part-time Hong Kong Chinese sub-degree finance students?

4.4.2 Specific Research Hypotheses

1. There is a significant relationship between gender and learning approaches of

both full-time and part-time Hong Kong Chinese sub-degree finance students.

2. There is a positive relationship between maturity (or age) and the deep approach of Hong Kong Chinese sub-degree finance students. Mature students are more likely than younger students to adopt the deep approach.

3. There is a positive relationship between internal locus of control and the deep approach of full-time and part-time Hong Kong Chinese sub-degree finance students.

4. There is a positive relationship between extracurricular activities and the deep approach of full-time and part-time Hong Kong Chinese sub-degree finance students.

The chi-square test is used to determine whether two variables are related. Chi-square is one of the non-parametric tests. The term parametric refers to a measure which describes the distribution of the population such as mean or variance. Assumptions of parametric tests include (1) the distribution of data is normal; (2) the variances of variables are equal or homogeneous (Creswell, 2003). Non-parametric tests do not depend on the above assumptions. This means the assumption of a normal population is not necessary. The chi-square test deals with nominal data. Nominal data measures variables which belong to two categories and have to be mutually exclusive such as gender. The results of the empirical tests in relation to the above research questions are presented as follows.

Hypothesis One – Gender Differences in Learning Approaches of Full-time Students

A Hypothesis is put forward concerning gender differences in learning approaches. Female students are likely to work harder, be better organized, spend more time on course work and be less distracted in the classroom than male students (Arnor *et al.*, 1999; Davies & Brember, 2001). This suggests that female students tend to adopt the deep approach. Hypothesis one proposes that there are gender differences in the learning approach of full-time students (Deep Learning Approach (DLA) and Surface Learning Approach (SLA)). The 2x2 contingency table is presented in Table 6.

Table 6: Gender Difference in the Learning Approaches of Full-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
Male	49	15	64
Female	48	19	67
Column totals	97	34	131

The chi-square test (with Yates Continuity Correction) indicates no significant relationship between learning approaches and gender, $\chi^2 (1, n = 131) = 0.20$, $p = 0.66$, $\phi = 0.056$ since the value of chi-square is not significant. Yates Continuity Correction is designed to compensate for a possible overestimate of the chi-square value by reducing each numerator by one-half unit before squaring in a 2x2 contingency table (Yates, 1934). The phi coefficient is a correlation coefficient with a range from -1 to 1 to measure the degree of association between the two variables. Cohen (1988) suggested that 0.1 is for small effect, 0.3 for medium effect and 0.5 for large effect.

Hypothesis Two – Gender Differences in Learning Approaches of Part-time Students

Hypothesis two suggests that there are gender differences in the learning approach of part-time students. The 2x2 contingency table is presented in Table 7.

Table 7: Gender Difference in Learning Approaches of Part-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
Male	44	6	50
Female	56	24	80
Column totals	100	30	130

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between learning approaches and gender of part-time students, $\chi^2 (1, n = 130) = 4.65$, $p = 0.031$, $\phi = 0.21$. The probability of obtaining this result by chance is very low ($p = 0.031$). In other words, part-time female students are more likely to adopt the deep approach than part-time male students.

Hypothesis Three – Is there a significant difference of learning approaches between full-part and part-time sub-degree students?

It is argued that younger and inexperienced students tend to adopt the surface approach (Aaron & Skakun, 1999). Mature students tend to have a sense of purpose and are expected to be more intrinsically motivated than younger students. Richardson (1994) proposed that mature students seem to be more likely than younger students to use the deep approach in higher education. Hypothesis three proposes that there is a difference in learning approach between full-time and part-time students. The average age of full-time students is younger than that of part-time students because all part-time students are working adults. The hypothesis is raised to see whether there is any evidence that mature students tend to employ the deep approach compared with younger students in Hong Kong sub-degree learning environment. The 2x2 contingency table is presented in following table.

Table 8: Study Mode Differences in Learning Approaches

Learning approach	DLA	SLA	Row totals
Full-time students	97	34	131
Part-time students	100	30	130
Column totals	197	64	261

The chi-square test (with Yates Continuity Correction) indicates no difference in learning approaches between full-time and part-time students, $\chi^2 (1, n = 261) = 0.16$, $p = 0.69$, $\phi = 0.033$ since the value of chi-square is not significant.

Hypothesis Four – Relationship between Locus of Control and Learning Approaches of Full-time Students

The term locus of control relates to an individual's beliefs about their control over life events. Someone may feel personally responsible for the things that happen to them which is called internal locus of control beliefs. Some people believe that their outcomes in life are determined by forces beyond their control such as fate, luck or other people which is labelled external locus of control beliefs. Watkins (1984) argued that if students believe that they have control over their own learning, they are more likely to use the deep approach. It is hypothesized that for students to want to adopt the deep approach requires them to have confidence in

their own academic ability and a conviction that they should not rely too much on the teacher but take responsibility for their own learning. Perceived lack of control is likely to lead to the belief of learning as a memory task. It is predicted that an external locus of control is correlated with the surface approach.

Hypothesis four proposes a relationship between locus of control and learning approach of full-time students (Deep Learning Approach (DLA) and Surface Learning Approach (SLA)). Internal locus of control and external locus of control are treated as nominal data. The 2x2 contingency table is presented in the following table.

Table 9: Locus of Control Differences in Learning Approaches of Full-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
Internal locus of control	69	11	80
external locus of control	28	23	51
<u>Column totals</u>	<u>97</u>	<u>34</u>	<u>131</u>

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between locus of control and learning approaches of full-time students, $\chi^2 (1, n = 131) = 14.34, p = 0.0002, \phi = 0.35$. The probability of obtaining this result by chance is very low ($p = 0.0002$). It suggests that full-time students with an internal locus of control belief are more likely to adopt the deep approach.

Hypothesis Five – Relationship between Locus of Control and the Learning Approaches of Part-time Students

Hypothesis five suggests a relationship between locus of control and the learning approach of part-time students. The 2x2 contingency table is presented in the following table.

Table 10: Locus of Control Differences in Learning Approaches of Part-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
Internal locus of control	69	9	78
external locus of control	31	21	52
<u>Column totals</u>	<u>100</u>	<u>30</u>	<u>130</u>

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between locus of control and the learning approaches of part-time students, $\chi^2 (1, n = 130) = 13.05$, $p = 0.0003$, $\phi = 0.34$. The probability of obtaining this result by chance is very low ($p = 0.0003$). It suggests that part-time students with the internal locus of control belief are more likely to adopt the deep approach.

Hypothesis Six – Relationship between Extracurricular Activities and Learning Approaches of Full-time Students

Hypothesis six proposes that there is a link between extracurricular activities and the learning approach of full-time students (Deep Learning Approach (DLA) and Surface Learning Approach (SLA)). Extracurricular activities are measured by the number of years which is divided into a high level of extra-curricular activities (more than 5 years in secondary and post-secondary schools) and a low level of extra-curricular activities (less than 5 years in secondary school and post-secondary schools). The 2x2 contingency table is presented in the following table.

Table 11: Extracurricular Activities Differences in Learning Approaches of Full-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
High	63	11	74
Low	34	23	57
<u>Column totals</u>	<u>97</u>	<u>34</u>	<u>131</u>

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between extracurricular activities and the learning approaches of full-time students, $\chi^2 (1, n = 131) = 9.60$, $p = 0.0019$, $\phi = 0.29$. The

probability of obtaining this result by chance is very low ($p = 0.0019$). It suggests that full-time students with a high level of extracurricular activities experiences are more likely to adopt the deep approach.

Hypothesis Seven – Relationship between Extracurricular Activities and the Learning Approaches of Part-time Students

Hypothesis seven proposes a relationship between extracurricular activities and the learning approach of part-time students. The 2x2 contingency table is presented in the following table.

Table 12: Extracurricular Activities Differences in the Learning Approaches of Part-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
High	72	11	83
Low	28	19	47
Column totals	100	30	130

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between extracurricular activities and the learning approaches of part-time students, $\chi^2 (1, n = 130) = 11.00, p = 0.0009, \phi = 0.31$. The probability of obtaining this result by chance is very low ($p = 0.0009$). This suggests that part-time students with a high level of extracurricular activities experiences are more likely to adopt the deep approach.

4.5 Study Two

Study two explores the relationship between the process variable (learning approaches) and the product variable (academic achievement) of both full-time and part-time sub-degree students. The 3P model assumes that presage variables may have both a direct impact on product variables and an indirect impact via process variables. The learning outcomes which students achieve from the learning process are the product factors. According to the 3P model, there is a positive relationship between deep approach and academic achievement. On theoretical grounds, it is argued that students using the deep approach are often academically high achievers (Brown & Nelson, 1983; Bruch *et al.*, 1986; Entwistle & Wilson, 1977) and maintain feelings of great satisfaction (Biggs, 1984, 1985). It is proposed that the surface approach is negatively correlated with academic achievement (Albaili, 1995; Cano, 2005; Drew & Watkins, 1998; Diseth, 2003; Entwistle *et al.*, 2000; Entwistle & Ramsden, 1983; Phan, 2006; Watkins, 2001; Wong & Watkins, 1998; Zeegers, 2001).

Study two tests quantitatively whether there is an association between the presage variables such as gender, locus of control, extracurricular activities, learning approach and the product variable (academic achievement). Smith and Naylor (2001) found that women were more likely than men to be awarded good degrees in the UK. It is argued that academic achievement is associated with gender differences and internal locus of control belief is associated with better academic achievement. Findley & Cooper (1983) reported that low perceived control was associated with poor academic achievement. Biggs (1985) suggested that a student with an internal locus of control belief would use the deep approach more effectively than a student with an external locus of control belief. Kletzing (1982) and Wilhite (1990) revealed a positive relationship between internal locus of control and better academic achievement. The specific research questions in this study that are examined are presented below.

4.5.1 Specific Research Questions

1. What is the relationship between learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students?

2. Is there a link between gender and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students?
3. Is there a link between locus of control and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students?
4. What is the relationship between gender, locus of control, extracurricular activities, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students?
5. What is the relationship between study mode, gender, locus of control, extracurricular activities, learning approaches and academic achievement of Hong Kong Chinese sub-degree finance students?

4.5.2 Specific Research Hypotheses

1. There is a positive relationship between learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.
2. There is a significant relationship between gender and the academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.
3. There is a positive relationship between internal locus of control and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.
4. There is a significant relationship between gender, locus of control, extracurricular activities, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.
5. There is a significant relationship between study mode, gender, locus of control, extracurricular activities, learning approaches and academic achievement of Hong Kong Chinese sub-degree finance students.

The results of the empirical tests in relation to the above hypotheses are presented as follows.

Hypothesis One – Relationship between Learning Approaches and Academic Achievement of Full-time Students

Hypothesis one proposes that there is an association between learning approaches and academic achievement of full-time students. If learning is positively valued,

students who feel more able to control would exert more effort in understanding the materials which would influence their academic achievement. Chi-square (χ^2) analysis is performed in which the R-SPQ-2F score is used to identify the deep approach and the surface approach and GPA is used as an index of academic achievement. Students are classified into two groups according to their GPA: (1) low academic achiever: students with grade C, D and E; (2) high academic achiever: students with grade A and B. The 2x2 contingency table is presented in following table.

Table 16: Relationship between Learning Approaches and Academic Achievement of Full-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
High Academic Achiever	61	9	70
Low Academic Achiever	36	25	61
<u>Column totals</u>	<u>97</u>	<u>34</u>	<u>131</u>

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between the learning approaches and academic achievement of full-time students, $\chi^2 (1, n = 131) = 11.99, p = 0.0005, \phi = 0.32$. The probability of obtaining this result by chance is very low ($p = 0.0005$). It suggests that full-time students using the deep approach are often academically high achievers.

Hypothesis Two – Relationship between Learning Approaches and Academic Achievement of Part-time Students

Hypothesis two proposes that there is an association between the learning approaches and academic achievement of part-time students. In the same way, students are classified into two groups: (1) low academic achiever: students with grade C, D and E; (2) high academic achiever: students with grade A and B. The 2x2 contingency table is presented in following table.

Table 18: Relationship between the Learning Approaches and Academic Achievement of Part-time Students

<u>Learning approach</u>	<u>DLA</u>	<u>SLA</u>	<u>Row totals</u>
High Academic Achiever	62	3	65
Low Academic Achiever	38	27	65
<u>Column totals</u>	<u>100</u>	<u>30</u>	<u>130</u>

The value of chi-square test (with Yates Continuity Correction) is significant which indicates a relationship between the learning approaches and academic achievement of part-time students, $\chi^2 (1, n = 130) = 22.92, p = 0.0000, \phi = 0.44$. However, one of the assumptions of chi-square test concerning the minimum expected frequency which should be at least 5 or greater is violated in this case. There is a restriction on using chi-square analysis where the high academic achievers using the surface approach is only 3 in this case.

Hypothesis Three – Gender Differences in Academic Achievement of Full-time Students

Hypothesis three proposes that there are gender differences in the academic achievement of full-time students: (1) low academic achiever: students with grade C, D and E; (2) high academic achiever: students with grade A and B. The 2x2 contingency table is presented in the following table.

Table 20: Gender Differences in Academic Achievement of Full-time Students

<u>Academic Achievement</u>	<u>High Achiever</u>	<u>Low Achiever</u>	<u>Row totals</u>
Male	28	36	64
Female	42	25	67
<u>Column totals</u>	<u>70</u>	<u>61</u>	<u>131</u>

The value of chi-square test (with Yates Continuity Correction) is significant which indicates gender differences in the academic achievement of full-time students, $\chi^2 (1, n = 131) = 3.99, p = 0.046, \phi = 0.19$. The probability of obtaining this result by chance is very low ($p = 0.046$). It suggests that full-time female students are more likely than full-time male students to be high academic achievers.

Hypothesis Four – Gender Differences in the Academic Achievement of Part-time Students

Hypothesis four states that there are gender differences in academic achievement of part-time students: (1) low academic achiever: students with grade C, D and E; (2) high academic achiever: students with grade A and B. The 2x2 contingency table is presented in the following table.

Table 21: Gender Differences in Academic Achievement of Part-time Students

<u>Academic Achievement</u>	<u>High Achiever</u>	<u>Low Achiever</u>	<u>Row totals</u>
Male	24	26	50
Female	41	39	80
<u>Column totals</u>	<u>65</u>	<u>65</u>	<u>130</u>

The chi-square test (with Yates Continuity Correction) indicates no gender differences in academic achievement of part-time students, $\chi^2 (1, n = 130) = 0.03$, $p = 0.86$, $\phi = 0.032$ because the value of chi-square is not significant.

Hypothesis Five – Relationship between Locus of Control and Academic Achievement of Full-time Students

Hypothesis five proposes that there is a relationship between locus of control and the academic achievement of full-time students: (1) low academic achiever: students with grade C, D and E; (2) high academic achiever: students with grade A and B. The 2x2 contingency table is presented in the following table.

Table 22: Relationship between Locus of Control and Academic Achievement of Full-time Students

<u>Academic Achievement</u>	<u>High Achiever</u>	<u>Low Achiever</u>	<u>Row totals</u>
Internal locus of control	46	34	80
external locus of control	24	27	51
<u>Column totals</u>	<u>70</u>	<u>61</u>	<u>131</u>

The chi-square test (with Yates Continuity Correction) indicates no relationship between locus of control and academic achievement of full-time students, $\chi^2 (1, n = 131) = 0.98$, $p = 0.32$, $\phi = 0.10$ because the value of chi-square is not significant.

Hypothesis Six – Relationship between Locus of Control and Academic Achievement of Part-time Students

Hypothesis eight proposes that there is a relationship between locus of control and the academic achievement of part-time students. The 2x2 contingency table is presented in the following table.

Table 23: Relationship between Locus of Control and Academic Achievement of Part-time Students

<u>Academic Achievement</u>	<u>High Achiever</u>	<u>Low Achiever</u>	<u>Row totals</u>
Internal locus of control	42	36	78
External locus of control	23	29	52
<u>Column totals</u>	<u>65</u>	<u>65</u>	<u>130</u>

The chi-square test (with Yates Continuity Correction) indicates no relationship between locus of control and academic achievement of part-time students, $\chi^2 (1, n = 130) = 0.80, p = 0.37, \phi = 0.09$ because the value of chi-square is not significant.

Hypothesis Seven – Relationship between Gender, Locus of Control, Extracurricular Activities, Learning Approaches and Academic Achievement of Full-time Students

Hypothesis seven investigates the relationship between gender, locus of control, extra-curricular activities, learning approaches and academic achievement of full-time students. Multiple regression analysis is performed in which the academic achievement served as the dependent variable and gender, locus of control, extra-curricular activities and learning approaches as independent variables.

On statistical grounds it is noted that regression analysis deals with correlation, not causation of variables. Regression analysis requires the following assumptions (Pedhazur, 1997). First, relationships between variables are linear. Second, normality refers that residual variables are normally distributed about the dependent variable. Third, homoscedasticity reflects the constancy of the residuals across values of the independent variables. Fourth, the assumption of low multicollinearity and singularity is upheld for all analyses. Multicollinearity reflects the independent

variables are highly correlated. With singularity, the variables are redundant because one independent variable is a combination of two or more other independent variables (Pallant, 2007).

Pre-analysis screening procedures are used to assess the assumptions of normality, linearity and homoscedasticity. Examination of residuals scatterplot and normal probability plot (P-P plot), which compares the cumulative distribution of actual data values with the cumulative distribution of a normal distribution, offers a test of the assumption of a normality of residuals. If the assumption is met, points will cluster around a straight line. The scatterplots of full-time and part-time students are provided in the appendix. The patterns in the normal P-P plot of residuals of both full-time and part-time students are deviated from a straight line. The normal P-P plots do not support the normality assumptions.

The assumption of homoscedasticity is assessed by the regression standardized residuals against the regression standardized predicted values. The scatterplots of full-time and part-time cases are presented in the appendix. If the residuals are roughly rectangularly distributed, the assumption of homoscedasticity is met. There is a clear pattern in both scatterplots, the assumption of homoscedasticity is violated.

Although the assumptions of normality and homoscedasticity are violated, it is argued that the sample size ($n > 100$) is large enough to produce valid results in regression analysis (Punch, 2005). The 0.05 level of confidence is used throughout the studies. The results of the regression analysis are presented in the following table.

Table 24: Relationship between Gender, Locus of Control, Extra-curricular Activities, Learning Approaches and Academic Achievement of Full-time Students

Variable	β	t	p
Gender	-0.21	-2.56	0.012
Locus of control	-0.27	-0.30	0.763
Learning approach	0.41	3.90	0.000
Extracurricular activities	-0.058	-0.67	0.504

Constant = 0.503

Adjusted $r^2 = 0.12$

F (4, 126) = 5.53, $p < 0.0004$

<u>Variable</u>	<u>VIF</u>
Gender	1.01
Locus of control	1.14
Learning approach	1.25
<u>Extracurricular activities</u>	<u>1.09</u>

Variance inflation factor (VIF) is a measurement of how much of the variation of the particular independent is not explained by the other independent variables. VIF values above 10 reflect a violation of multicollinearity assumption. All the VIF values are less than 1.5 and the multicollinearity assumption is not violated. Adjusted coefficient of determination, r^2 , reflects the proportion of the variation in the dependent variable explained by independent variables. Adjusted r^2 equals 0.12 which implies that the model is providing an explanation of 12 percent of the variance in academic achievement.

Beta coefficients of gender and learning approach variables are statistically significant where p-value is less than 0.05. Gender and learning approach are making a significant contribution to the prediction of academic achievement in the case of full-time students.

Hypothesis Eight – Relationship between Gender, Locus of Control, Extracurricular Activities, Learning Approaches and Academic Achievement of Part-time Students

Hypothesis eight investigates the relationship between gender, locus of control, extra-curricular activities, learning approaches and the academic achievement of part-time students. Multiple regression analysis is performed in which the academic achievement served as the dependent variable and gender, locus of control, extracurricular activities and learning approaches as independent variables.

Table 25: Relationship between Gender, Locus of Control, Extracurricular Activities, Learning Approaches and Academic Achievement of Part-time Students

Variable	β	t	p
Gender	-0.12	-1.50	0.136
Locus of control	-0.038	-0.44	0.662
Learning approach	0.56	5.29	0.000
Extracurricular activities	0.024	0.28	0.782

Constant = 0.457

Adjusted $r^2 = 0.18$

F (4, 125) = 8.28, p < 0.0000

Variable	VIF
Gender	1.09
Locus of control	1.16
Learning approach	1.25
Extracurricular activities	1.12

All the VIF values are less than 1.5 and the multicollinearity assumption is not violated. Adjusted r^2 equals 0.18 which implies that the model is providing an explanation of 18 percent of the variance in academic achievement. Only beta coefficient of learning approach variables is statistically significant where p-value is less than 0.05. Learning approach is making a significant contribution to the prediction of academic achievement in the case of part-time students.

Hypothesis Nine – Relationship between Gender, Locus of Control, Extra-curricular Activities, Study Mode, Learning Approaches and Academic Achievement

Hypothesis nine investigates the relationship between gender, locus of control, extra-curricular activities, study mode, learning approaches and academic achievement. Multiple regression analysis is performed in which the academic achievement served as the dependent variable and gender, locus of control, extracurricular activities, study mode and learning approaches as independent variables.

Table 26: Relationship between Gender, Locus of Control, Extracurricular Activities, Learning Approaches and Academic Achievement of Part-time Students

Variable	β	t	p
Gender	-0.16	-2.80	0.005
Locus of control	-0.027	-0.43	0.664
Learning approach	0.49	6.47	0.000
Study Mode	0.064	1.12	0.265
Extracurricular activities	-0.014	-0.24	0.807

Constant = 0.442

Adjusted $r^2 = 0.17$

F (5, 255) = 10.50, p < 0.0000

Variable	VIF
Gender	1.03
Locus of control	1.14
Learning approach	1.25
Study mode	1.02
Extracurricular activities	1.11

All the VIF values are less than 1.5 and the multicollinearity assumption is held. Adjusted coefficient of determination, r^2 , equals 0.17, the model is providing an explanation of 17 percent of the variance in academic achievement. Beta coefficients of gender and learning approach variables are statistically significant where p-value is less than 0.05. Gender and learning approach are making a significant contribution to the prediction of academic achievement. Study mode is not making a significant unique contribution to academic achievement.

4.6 Summary of Findings

Several major findings can be summarized. First, the R-SPQ-2F and CDSII are valid and reliable instruments for assessing the learning approaches and locus of control of full-time and part-time Hong Kong Chinese sub-degree finance students. The psychometric properties of both R-SPQ-2F and CDSII are similar to the results of previous studies supporting the validity and applicability of the instruments in this study. Second, individual student characteristics such as locus of control and extracurricular activities are found to have a direct effect on the deep approach. Third, the study contends there are gender differences in the learning approach of part-time students. Fourth, a positive relationship between deep approach and academic achievement is found in the case of both full-time and part-time students. Finally, the study suggests that there are gender differences in academic achievement of full-time students.

Chapter 5 Discussion

5.1 Introduction

The topic of students' learning approaches and academic achievement has been researched from various perspectives over the last three decades (Biggs, 1987, 1989, 1993a, 1993b; Curry, 1991; Entwistle & Ramsden, 1983; Hattie, 2008; Leung & Kember, 2003; Murray-Harvey, 1994; Ramsden, 1988; Richardson *et al.*, 1987; Säljö, 1981; Trigwell & Prosser, 1991; Watkins & Biggs, 1996; Wittrock, 1991; Zhang, 2000). The present study is designed to empirically test Biggs's 3P model of the relationship between gender, study mode, locus of control, extracurricular activities, learning approaches and the academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students. Data is gathered from 131 full-time and 130 part-time Hong Kong Chinese sub-degree finance students. Statistical results suggest that the research instruments of the Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) and the Revised Causal Dimension Scale (CDSII) are reliable and valid for assessing the underlying theoretical constructs of both full-time and part-time Hong Kong Chinese sub-degree finance students.

The results of the present research will be discussed in two sections. The first section discusses the significance of the statistical results in relation to the specific hypotheses of study one. The second section presents the overall significance and implications of the results in relation to study two.

5.2 Study One: Psychometric Properties of the Research Instruments

It is important to validate the reliability of both R-SPQ-2F and CDSII prior to conducting subsequent statistical analyses based on the data generated by these research instruments. The internal consistency reliability alphas of the R-SPQ-2F are within the acceptable range. The result is consistent with studies by Biggs *et al.* (2001) using samples in Hong Kong university students. The internal consistency reliability alphas of the CDSII are within the acceptable range according to McAuley *et al.* (1992). It contends that both research instruments are reliable tools in the case of full-time and part-time Hong Kong Chinese sub-degree finance students.

5.3 Study One: Gender Differences in Learning Approaches

The first research question in study one addresses the gender differences in the learning approaches of both full-time and part-time Hong Kong Chinese sub-degree finance students. Specifically, female students are expected to use the deep approach more than male students.

The results suggest that there are gender differences in the learning approaches of part-time Hong Kong Chinese sub-degree finance students. Part-time female students are more likely to use the deep approach than part-time male students. It is recognized that gender differences in learning approaches might emerge in specific teaching and learning environments, cultural contexts, or through particular forms of academic assessment. For example, Hudson (1972) commented on the gendered nature of the arts and sciences in higher education: “Artist, poet and novelist are all seen in my studies as warm and exciting, but as of little worth. Mathematician, physicist and engineer are all seen as extremely valuable, but also as dull and cold ... Yet the scientist is seen as masculine, the arts specialist as slightly feminine (p.83)”.

There is an absence of gender differences in the learning approach of full-time sub-degree students. The results of studies of gender differences in learning approaches are mixed. Studies by Rose *et al.* (1996), Sadler-Smith (1996), Sadler-Smith and Tsang (1998) and Wilson *et al.* (1996) indicated no gender differences in learning approaches. It is possible that gender differences vary with the degree of gender stereotyping that is important in different societies. Further studies of gender differences in learning approaches across different years and disciplines of study are needed.

5.4 Study One: Relationship between Age, Study Mode and Learning Approaches

The second research question focuses on the differences in learning approaches between mature (part-time) and younger (full-time) sub-degree students. All the full-time sub-degree students are classified as younger students where their average age is 20 and none of the students' age is greater than 23. All the part-time students are categorized as mature students because all of them are working adults and their

average age is 28. All the full-time students go straight from secondary school into sub-degree programmes in Hong Kong.

Harper and Kember (1986) suggested three possible explanations for mature students' learning approach. First, mature students are motivated more by intrinsic goals than by vocational ones. Richardson (1995), Sadler-Smith (1996) and Watkins and Hattie (1981) indicated that mature students scored significantly higher on the deep approach than non-mature students. A combination of age and work experience tends to provide them with greater confidence in interacting with others. This might suggest that mature students might be more motivated to learn and develop their capability compared with their younger counterparts. Second, younger students are likely to adopt the surface approach in the final years of secondary education in Hong Kong. It is argued that the strong drive for examination success results in a preponderance of didactic teaching and the surface approach to learning for secondary students (Watkins & Biggs, 2001). Third, the previous life experience of mature students encourages the deep approach in higher education. Biggs (1985) suggested that the deep approach seemed to be facilitated by 'the planning and decision-making that is part and parcel of adult living (p.191)'. Younger students may be less convinced of the relevance of some skill sets. Mature students are likely to have a break from full time education and to have lost some learning skills. Their learning difficulties may have increased in terms of memory and the mental flexibility required adopting new thinking.

The effect of age and study mode is examined by a chi-square test which treats study mode as a categorical variable. The sample is divided into two study mode categories – part-time and mature students (age 23 years or over) as well as full-time and younger students (age less than 23 years). This is placed as a logical point to divide students who had come straight from secondary school (full-time and younger students) from those who had come via other routes with working experiences (part-time and mature students) in Hong Kong.

The descriptive statistics reveal that the scores of the deep learning are higher for part-time students. The present study contends that there is no difference between mature (part-time) students and younger (full-time) students in learning approaches.

A number of potential explanations are examined. First, age effect does not appear in sub-degree finance students. Interaction between disciplines of study and age might emerge in particular disciplines such as business and science. Second, both mature (part-time) and younger (full-time) students are studying in the same sub-degree finance programmes. The results suggest that the effect of study mode in learning approaches is negligible given similar teaching and learning contexts as well as course assessment. Although Harper and Kember (1986) argued that most of the younger Hong Kong students tend to adopt the surface approach in response to the system of didactic teaching and public examinations in secondary schools, the design of sub-degree programmes encourages the deep approach by using active teaching methods. Examination pressure is expected to be reduced when assessment comprises course work (40%) and examination (60%). Third, although work experiences might encourage students to use the deep approach, it raises the argument that different work experiences are needed to take into account of the impact.

Richardson (1995) argued that the stereotype of mature students as lacking the study skills especially for effective learning in higher education was not correct. For example, work experiences from retail industry may build up different skill sets such as business communication skills for mature students. Students may not be able to apply such experiences in studying finance subjects which requires quantitative skills and abstract thinking. The present results contend that there is no simple monotonic relationship between age, study mode and learning approaches.

5.5 Study One: Relationship between Locus of Control and Learning Approaches

Previous studies (Ramanaiah *et al.*, 1975; Watkins & Astilla, 1984) argue that a learner who has an internal locus of control belief is likely to have a deep motive and takes up personal responsibility for his/her learning task by using the deep approach. The learner would like to obtain a deeper understanding of the study materials. The results of the present study suggest a direct relationship between internal locus of control and deep approach. External locus of control belief, however, is likely to encourage the surface approach.

This is in line with traditional views that students who are confident and self-motivated to learn are willing to spend more effort on learning materials and achieve better academic achievement than those who are not. Therefore, an internal locus of control belief encourages the deep approach which subsequently positively influences their academic achievement. An important implication of the results is that the sub-degree institutions should provide learning assistance workshops to enhance students' learning skills and to cultivate an internal locus of control belief through interactive teaching and learning environment. It is appropriate to consider the pedagogical implications and management of the relationship between locus of control and learning approaches. For example, teachers can assign students to engage in projects to investigate various economic or social issues such as economic development in China, housing problem in Hong Kong, ageing, divorce, etc. Study groups are formed to explore various issues and prepare a set of arguments and questions in their topics. Study groups are required to conduct research and presentation in the classroom. Evaluation of each group will be based on research outcomes and findings presentation. Students are encouraged to become involved in their learning tasks and to deploy the deep approach which emphasizes the meaning of the learning materials. The focus is on generating positive feelings in students' learning tasks rather than creating negative comparisons between classmates. Studies by Perry *et al.* (1993) supported the notion of learning assistance programme for academically at-risk students where a positive relationship between internal locus of control belief and deep approach was found.

5.6 Study One: Relationship between Extracurricular Activities and Learning Approaches

It is assumed that students' extracurricular experiences are considered as part of the individual student characteristics in presage variables of the 3P model. The results suggest that extracurricular activities are positively related to the deep approach rather than the surface approach. A student with a high level of extracurricular activities is more likely to use the deep approach. It can be argued that extracurricular activities enhance students' confidence in their learning ability which encourages a deep motive in their learning. This result is consistent with previous studies (Hattie *et al.*, 1997; Zhang, 2000) which suggests a positive relationship between deep approach and extracurricular activities.

Zhang (2000) found that extracurricular activities were negatively related with the surface approach in China, Hong Kong and US university students. It is argued that inadequate extracurricular experience may negatively affect learning motivation (Zhang, 2000). Further studies are needed to explore which type of extracurricular experience have a stronger impact on the deep approach.

5.7 Study Two: Relationship between Learning Approaches and Academic Achievement

Students who adopt the deep approach tend to conceive of learning as transforming information, to be intrinsically motivated and to deploy learning strategies which emphasize the meaning of the learning material. Students who use the surface approach tend to conceive of learning as reproducing knowledge, to be extrinsically motivated and to adopt strategies which focus on the reproduction of learning materials. The results contend that there is a positive relationship between deep approach and academic achievement of both full-time and part-time Hong Kong Chinese sub-degree finance students.

The positive relationship between deep approach and academic achievement may be caused by a variety of factors. First, the assessments of sub-degree finance students appear to reward the deep approach because the essay-type questions require students to apply analytical and critical thinking skills. Students who use the deep approach may not match the specific demands of the assessment in other disciplines. Byrne and Willis (1997, 2001) argued that public school examinations in Ireland promoted the surface approach. Biggs (1999), Marton & Säljö (1976a, 1976b) and Sternberg (1997) argued that the assessment format has a strong impact on how students approach their study. Second, learning approaches can be affected by variables such as heavy course work, didactic teaching method, or over-lecturing in Hong Kong (Gow *et al.*, 1996). Zubir (1988) found that the learning approach adopted by students was largely influenced by the teaching styles in Malaysia. Most of the sub-degree institutions in Hong Kong encourage active teaching styles by using a mix of lecture, group discussion, rote-play, field trips and stimulation. Third, Rosenthal and Jacobson (1968) proposed a self-fulfilling prophecy in which teachers believed that their students use predominantly rote-learning methods so use

surface level assessment items. Their expectations are fulfilled when the students use the surface approach to complete their learning tasks. It is possibly the case that teachers' expectation may affect their teaching approach and subsequently influence learning approach adopted by students.

Good academic results might come to students who adapt to the actual demands of the situation, which are to master the major materials in examinations effectively or write appropriate essays. The research on learning approaches has emphasized the role of the teaching context in encouraging the deep approach (Biggs, 1993b). Although the role of teaching and assessment methods cannot be downplayed, the present findings add another perspective to improving academic achievement. Teachers may make use of the relationships between extracurricular activities, learning approaches and academic achievement. Out-of-class teaching and learning opportunities such as study trips, discussion forums and experience-sharing sessions by industry practitioners may encourage students to adopt the deep approach. Rote-learning design curriculum may affect the learning approach adopted by students. Biggs (1989) argued that curriculum design and assessment methods influenced the learning approaches adopted by Hong Kong students and students are not resistant to various teaching methods.

Biggs (1993a) and Allinson (1992) suggested that each student has a preferred learning approach which depends on the students' personality and the students' interaction with their learning environment. It is argued that the learning approach used is a function of the rewarding ability to get things done which is what their parents will require of the majority of our students, rather than creating new ideas and depth of thought. Phan and Deo (2007) argued that the parental and societal pressure to achieve high academic results, enabling economic and social mobility, enforces a mindset for many Indo-Fijian university students to adopt the surface approach. These students think that the notion of being able to pass tests and public examinations with good grades is part of effective learning. The cycle is perpetuated at the university where most students still adopt the surface approach. Further studies are needed to explore the relationship between parental pressure and learning approaches.

Are mature students more prone to using the deep approach than young students? The present results fail to find any association between study mode (full-time and part-time) and learning approaches of Hong Kong Chinese sub-degree finance students. It suggests that differences in teaching methods may not be required for part-time or full-time sub-degree students given that the course curriculum and assessment methods are similar in full-time and part-time programmes. Although the present results do not suggest a difference of learning approach between full-time and part-time Hong Kong Chinese sub-degree finance students, further studies are needed to consider differences in learning culture and subject areas in various higher education institutions.

From a practical perspective, the present study contends that lecturers should be aware of the impact of learning approach on academic achievement. Ramsden (1992) argued that raising students' awareness of learning approaches is an integral part of effective teaching. Teachers should explore how students are approaching the course content they teach. However, certain groups of students might need to be taught the relationship between locus of control, extracurricular activities, learning approach and academic achievement more explicitly and encourage to use the deep approach which will enhance their academic achievement.

Deep learning motivation can be enhanced by providing effective formative assessment, especially immediate feedback and using peer and self assessment, generating classroom learning tasks more relevant to practical applications, helping students to work on the objective setting of their assignments and learning to accept responsibility for their learning. Learning assistance workshops can be provided for academically low-achieving students to emphasize how to process and analyze information effectively; how to examine the logic of the argument and how to relate concepts to evidence. Learning assistance workshops offer learning strategies to strengthen students' reading and analytical skills and identify students with either the internal locus of control belief or the external locus of control belief.

It should be noted that the relationship between learning approach and academic achievement may be sample specific (Diseth, 2003). Lizzio *et al.* (2002) showed a positive relationship between deep approach and academic achievement of

commerce degree students but science and humanities students did not reveal such a relationship. Diseth (2003) argued that the deep approach is likely to link with academic success in the later years of degree programme. The present study is limited by the sample which comprises sub-degree final-year finance students. It suggests that follow-up studies of these students are needed to explore how the university learning environment affects their learning approach. Watkins (2001) recognized that the relationship between learning approaches and academic achievement assumed that higher quality learning outcomes were rewarded by the assessment system. It is argued that a better GPA does not necessarily imply a higher quality learning outcome.

5.8 Study Two: Relationship between Gender and Academic Achievement

Hypotheses have been put forward concerning gender differences in academic achievement in Britain and North America higher education institutions over the past two decades (Arnor *et al.*, 1999; Davies & Brember, 2001; Herlitz *et al.*, 1997; Meyer *et al.*, 1994; Miller *et al.*, 1990; Richardson & King, 1991; Ruban & McCoach, 2005; Sadler-Smith, 1996; Stumpf & Jackson, 1994; Thomas, 1988; Wilson *et al.*, 1996). Men and women appear to perform at similar levels in learning tasks. It is argued that women seem to outperform men in situations requiring the acquisition of new information (Meinz & Salthouse, 1998; Stumpf & Jackson, 1994).

Woodley (1984) found that there were gender differences in academic achievement with advancing age and women aged 21 or over were more likely to obtain an honours degree than men in Britain. The present results fail to find any association between gender and academic achievement of part-time Hong Kong Chinese sub-degree students. The study suggests that full-time female students are more likely than full-time male students to be high academic achievers. Qualitative studies by Thomas (1988) revealed significant differences in the learning experiences of men and women between arts programmes where men often comprise the minority of students and science programmes where men often comprise the majority of students. While the present study only focuses on finance students, the learning experiences of men and women in different discipline contexts need to be explored in the case of Hong Kong Chinese sub-degree students.

Gender differences in academic achievement may be affected by the different teaching and assessment methods used in various academic disciplines.

5.9 Study Two: Relationship between Locus of Control and Academic Achievement

It is argued that students who achieve high grades in school take responsibility for their performance and students who do poorly attribute responsibility to external factors. The results of the present study fail to find any association between locus of control and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students. The results are in line with the study by Stipek and Weisz (1981), where locus of control did not predict the academic achievement of white students.

With regard to the practical situation, it is reasonable to assume that both academic achievement and locus of control are multi-determined. It suggests that a single variable is not likely to generate substantially stronger bivariate correlations. For example, shared variance with other variables such as socio-economic status, assessment and teaching environment might account for the relationship. Findley and Cooper (1983) found that the strength of relationship tended to be stronger for adolescents than for adults and teachers' grading of students may be affected by a number of factors unrelated to locus of control such as physical characteristics of the student.

5.10 Limitations of the Study

In studying the impact of variables on academic achievement, several points needed to be taken into account. The results are not entirely consistent with the 3P model. The empirical results are less than conclusive. There are some specific methodological limitations to this study. These contain the variables and their inter-relationships. The findings of the present study are limited by the following methodological and measurement constraints.

1. *Linear and curvilinear relationship.* Correlation is often used in exploring relationship. The limitation of simple correlation assumes a linear relationship but curvilinear relationships can happen in practice. By using a linear correlation, a

curvilinear relationship between variables could propose no relationship where there is actually one. It is also important to note that a model in which the directionality between these variables is opposite or bi-directional might be supported by the data (Kember & Leung, 1998). The present study is based on correlations and qualitative research is useful to provide a further support for causality. The data are cross-sectional and the presence of reciprocal relationships between variables may not be identified. Even with careful analysis and interpretation, the analysis could not be used to infer causation. Studies based upon data used in this study necessarily come to somewhat tentative conclusions.

2. *The variables in interaction.* In situations where there are a number of variables that may affect academic achievement, it is noted that there is an interaction of their effects on academic achievement when analysed with other variables.

3. *The exclusive reliance on self-report responses to close-ended questionnaires.* There are no other measures to validate that the way students respond to the survey is reflective of how they normally behave honestly. It is possible that students may not be honest to answer in a socially desirable way or the way they think the researcher wants them to respond which might lower reliability of some individual scales (Kember & Gow, 1991). Students may not be serious about filling the questionnaire and may not exactly know how they understand their learning. The quality of data collection depends on conditions of the context at the given time. The findings assert general characteristics of the participating students at one point in time. Learning approaches are measured by using self-report instruments, which are not context-specific. Pintrich *et al.* (2000) recommended using an instrument adapted at the course level was a good compromise between an overly global level, focused on college learning in general, and a more micro-analytic level, focused on different tasks within a course.

4. *Sample size.* It is argued that there are many individual student characteristics variables to be controlled in studying the interaction between individual differences, learning approaches and academic achievement. One concern of this is that studying the effects of many individual student characteristics variables may require the use of very large sample sizes. Small sample sizes will constrain the study to the

consideration of only a few variables. The sample from which the population is selected may not be representative of sub-degree students in general. The sample size is not large so that any generalizations have to be tentative. The present study only treats samples found at one sub-degree institution in Hong Kong. There must be some doubt about the generalisability of findings from one institution. Notably, when samples from several colleges are used, differences between the schools in terms of teaching quality, learning environment, curriculum and assessment should be taken into consideration. The future replication of the present results by using different samples would be desirable.

5.11 Summary

The contribution of this research can be considered from the dual perspective of research and practice. From a research viewpoint, the results of this study have built up our knowledge about the 3P model in respect of both full-time and part-time Hong Kong Chinese sub-degree finance students. The results contend there is a direct relationship between internal locus of control and deep approach of full-time and part-time Hong Kong Chinese sub-degree finance students. Extra-curricular activities are found to be positively related to the deep approach rather than the surface approach. The present study suggests a positive relationship between a deep approach and academic achievement indicates that the issue of how to generate a learning environment that encourages the deep approach is important.

From a practical viewpoint, the results of the present study suggest a number of ways to enhance teaching and learning in a sub-degree context. First, both teachers and students should be aware that people approach learning differently. Second, both teachers and students should be aware of the relationship between learning approaches and academic achievement. Third, the present study suggests that extracurricular activities are directly related to the deep approach. Hence, the enhancement of students' extracurricular activities is desirable. Further studies are needed to investigate what kind of extra-curricular activities would have a stronger effect on the deep approach.

The findings allow teachers and education administrators to recognize the importance of relationships between individual student characteristics, learning approaches and academic achievement. Previous studies found that assessment methods influence learning approaches (Gibbs, 1992; Ramsden, 1987). In other words, using assessments that are conducive to the deep approach is needed. Teachers can cultivate the deep motive through a variety of teaching methods such as inviting guest speakers, facilitating co-operative learning tasks, having group discussion, organizing seminars, having field visits and using various visual aids in teaching. Deep learning motives can also be cultivated by offering students the opportunity to participate in out-of-the-class activities such as adventure education. Hattie *et al.* (1997) found that adventure education can cultivate students' creative

thinking and the deep learning motive.

The interactions between individual student characteristics, learning approaches and academic achievement warrants further studies in the Hong Kong sub-degree context. Future research can be considered from the following perspectives. First, causal modelling procedures must be examined and interpreted with caution. More powerful statistical approaches with longitudinal designs to test the models are needed. Second, the present study is based on statistical correlations. Qualitative research is useful to produce a strong support for causality. Qualitative approaches are useful to explore the learning approach in a specific learning environment. The possible impact of interactions and non-linear effects should be considered in quantitative studies. Third, considering the complexity of the possible individual effects, large-scale studies are useful which include large sample sizes and a wide range of variables. This suggests the need for future studies to investigate the 3P model by collecting data from different Hong Kong sub-degree institutions and using longitudinal studies to address some limitations of the present study such as different teaching and learning environments and a variety of course assessment.

Chapter 6 Conclusions

6.1 Discussion

There have been a number of studies on the relationship between individual student characteristics and academic achievement and such individual differences include self-concept, self-confidence, self-esteem (Allen, 1992; Fuertes *et al.*, 1994; Hau, 1992; Hau & Salili, 1991; Ho *et al.*, 1999; Kwok & Lytton, 1996; Schmeck *et al.*, 1991; Sinclair, 1991; Wilhite, 1990), gender (Arnor *et al.*, 1999; Davies & Brember, 2001; Herlitz *et al.*, 1997; Meyer *et al.*, 1994; Miller *et al.*, 1990; Richardson & King, 1991; Ruban & McCoach, 2005; Sadler-Smith, 1996; Stumpf & Jackson, 1994; Thomas, 1988; Wilson *et al.*, 1996), age (Boon, 1980; Clennell, 1990; Harris & Brooks, 1998; Nyberg *et al.*, 1996; Richardson, 1995; Richardson & Woodley, 2003; Sadler-Smith, 1996; Sadler-Smith & Tsang, 1998; Watkins & Hattie, 1985; Woodley, 1984) and ethnicity (Hackett *et al.*, 1992). Two major learning approaches, the deep approach and the surface approach, have been distinguished by several researchers over the past two decades (Biggs, 1979, 1985, 1987, 1989; Entwistle & Ramsden, 1983; Marton & Säljö, 1976a, 1976b). The interaction of individual student characteristics with the learning approaches has a strong impact on academic achievement.

The 3P model (Biggs, 1987, 1989, 1993a, 1993b) provides a theoretical framework of the relationships between individual student characteristics, teaching context, learning approaches and academic achievement. Student learning is viewed as a multi-variate integrated system consisting of variables in a series of stages entitled presage, process and product. These three sets of variables include (1) before the learning takes place, such as the learning environment and individual student characteristics (presage), (2) while learning is taking place; i.e. students' approach to learning (process) and (3) the learning outcomes after learning has taken place (product). The model proposes that personal and situational factors (presage) influence a student to adopt a specific approach to learning (process) which in turn influences the learning outcomes (product). The deep and surface approaches are classified by the model. Students who adopt the deep approach tend to conceive of learning as transforming information, being intrinsically motivated and deploying learning strategies which emphasize the meaning of the learning

material. Students who use the surface approach tend to conceive of learning as reproducing knowledge, being extrinsically motivated and adopting strategies which focus on the reproduction of learning materials.

The 3P model focuses on student motivation: what students tend to get out of a learning task affects the learning approach they adopt, which in turn influences academic achievement. The 3P model is directly related to higher education learning environment and provides a comprehensive framework to examine a complex multi-faceted learning process which addresses personal and situational factors influence a student to adopt a specific learning approach which in turn influences the academic achievement. The model proposes a positive relationship between deep approach and academic achievement. A large amount of model development and empirical tests have been conducted in the area of student learning in tertiary education (Biggs, 1987; Entwistle & Entwistle, 1991; Marton & Booth, 1997; Marton *et al.*, 1997; Murray-Harvey, 1993; Prosser & Trigwell, 1999; Sadler-Smith, 1996; Watkins & Biggs, 2001). The relationship between learning approaches and academic achievement is by no means straightforward. Comparatively little is known about any difference in learning approaches between full-time and part-time sub-degree students in the Hong Kong context. These questions are important for sub-degree educators in Hong Kong to enhance their course design and teaching practice for both full-time and part-time students.

Following the expansion of Hong Kong sub-degree sector, there is a pressing need to explore the relationship between learning approaches and academic achievement in an attempt to enhance the effectiveness of student learning. The present study aims to investigate the relationships between gender, age, study mode, locus of control, extracurricular activities, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students. It is hypothesised that gender, age, study mode, locus of control and extracurricular activities influence students' learning approaches and subsequently affect their academic achievement. The main research questions that are examined are presented below.

(1) Is there link between gender and learning approaches of part-time and full-time

Hong Kong Chinese sub-degree finance students?

(2) Does study mode (full-time and part-time) affect learning approaches of Hong Kong Chinese sub-degree finance students?

(3) Is there link between locus of control and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?

(4) Is there any relationship between extracurricular activities and learning approaches of part-time and full-time Hong Kong Chinese sub-degree finance students?

(5) Is there a positive relationship between deep approach and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?

(6) Do Hong Kong sub-degree students seek to adopt particular learning approaches?

(7) Is there any relationship between gender and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?

(8) Is there any relationship between locus of control and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?

(9) Is there any relationship between gender, locus of control, extracurricular activities, learning approaches and academic achievement of part-time and full-time Hong Kong Chinese sub-degree finance students?

(10) Is there any relationship between gender, study mode, locus of control, extracurricular activities, learning approaches and academic achievement of Hong Kong Chinese sub-degree finance students?

Statistical analysis contends that two research instruments, the Revised Two-Factor Study Process Questionnaire (R-SPQ-2F) and the Revised Causal Dimension Scale (CDSII), are reliable and valid for assessing the underlying theoretical constructs for both full-time and part-time Hong Kong Chinese sub-degree finance students. The present results suggest that individual student characteristics including locus of control and extracurricular activities influence the learning approaches of full-time and part-time Hong Kong Chinese sub-degree finance students. It does seem reasonable that teachers should be alert to differences in locus of control of both full-time and part-time students. The present result encourages teachers to recognize individual differences and to make an effort to

motivate students to learn in a more effective way. More needs to be known about individual student characteristics of both full-time and part-time sub-degree student in different disciplines and what skills they bring to further studies such as degree programmes. There is no simple monotonic relationship between age, gender, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students.

It seems clear that there are gains in theory-building to be achieved from exploring the relationships between individual student characteristics, learning approaches and academic achievement of full-time and part-time Hong Kong Chinese sub-degree finance students. The present study suggests that the deep approach and academic achievement are positively related. It is suggested that students should learn some basic learning strategies in order to enhance their academic achievement. The basic learning strategies should focus on how to enhance students' analytical thinking, critical thinking skill, reading skill and lifelong learning perception. This enhancement in learning strategies is only a necessary condition, not a sufficient condition, to improve academic achievement. This is the first study of the relationship between learning approach and academic achievement involving full-time and part-time Hong Kong Chinese sub-degree finance students and replications of this study would be valuable to verify this relationship. It is believed that one of the most effective ways of ensuring high quality teaching and learning is to encourage students to use the deep approach and teachers take responsibility to promote the deep approach to learning.

Learning motivation in higher education needs to be considered as a dynamic phenomenon which can be influenced by curriculum design and the nature of the teaching and learning environment. The results of the study can help to enhance the teaching and learning of Hong Kong Chinese sub-degree finance students in two ways. First, as the deep approach tends to lead to better academic achievement, the question that arises is how to create a learning environment that is more conducive to the deep approach. According to many investigators (Biggs, 1999; Marton & Säljö, 1976a, 1976b; Entwistle & Ramsden, 1983; Salili *et al.*, 1976; Sternberg, 1997), course assessment has a strong influence on how students approach their study. Assessments such as project assignments, group presentations or individual

research papers are recommended to encourage the deep approach.

Although numerous studies have been conducted on different individual student characteristics, there is little conclusive empirical support for the 3P model (Beckwith, 1991; Trigwell & Prosser, 1991; Watkins, 1983; Zeegers, 2001). This situation can be partly explained by (1) the diversity of research methods, (2) different statistical analyses used, (3) various sample sizes ranging from secondary to tertiary students, (4) cultural factor and (5) teaching and learning environment. Studies based upon data used in the present study necessarily come to somewhat limited and tentative conclusions, leaving much intuitive interpretation. The results of the present study need to be interpreted with some caution. First, the sample size is not large and only sub-degree finance students are investigated. Further studies in this area require enlarged sample sizes and a diverse range of fields of study would be necessary to confirm the tentative findings and to allow further generalization of these results. The results are concerned with the restricted origin of participants (coming from only one sub-degree institution). Second, another limitation of this study is the exclusive reliance on self-reporting measures by using both R-SPQ-2F and CDSII. The present study is mostly quantitative in nature. Open-ended interviews allow researchers to take an inductive approach to investigate students' thoughts and their learning approaches. Qualitative study may yield additional insights into the process of understanding factors influencing academic achievement. Third, the limitation of the present study assumes a linear relationship between individual student characteristics, learning approaches and academic achievement but nonlinear relationship can happen in practice.

There is a need for longitudinal research to investigate these relationships in an attempt to generate firmer predictive and causal relationships. Such research is significant especially for developing countries hoping to enhance their human resources because it may improve teaching methods, course content, assessment method and workload through the understanding of the relationship between individual student characteristics, learning approaches and academic achievement. The present results are in a direction consistent with the statistically significant relationships. Continuing studies in this area will make use of increased sample sizes, an expanded range of fields of study, as well as more refined instruments, all

of which might be expected to increase the effect size of the relationships observed.

6.2 Implications of the Research Findings

The present study has produced a picture of individual student characteristics, learning approaches and their relationships with academic achievement in a specific learning context. Some findings are in line with Western research findings and conform to Western theoretical contentions. Student learning could be seen as a result of the intricate interplay of individual student characteristics, learning approaches and academic achievement. An understanding of these relationships may affect curriculum design, counselling of students, and building a model of the learner.

The contributions of the present study are considered from research and practical perspectives. From a research viewpoint, the results of this study have enriched knowledge of the 3P model of full-time and part-time Hong Kong Chinese sub-degree finance students. First, the results of the study suggest a positive association between students' internal locus of control belief and deep approach, teachers should recognize this individual difference and try different teaching approaches to encourage students to use the deep approach. The results are compatible with the objectives of higher education which emphasizes the development of higher order learning goals such as critical thinking, analytical skills, problem solving techniques and the ability to deal with ill-defined issues through the deep approach.

Second, the present study suggests a direct relationship between extracurricular activities and deep approach. It is common for sub-degree institutions to encourage students to participate in various types of extracurricular activities in Hong Kong. It is recognized that extracurricular activities play a key role in whole-person education. Enriching students' extracurricular activities appears to be one of the important elements to encourage students to adopt the deep approach. Sub-degree students also recognize that a combination of good academic achievement, performance in university admission interviews and achievement of extra-curricular activities is important when considering their application for government-funded

university places in Hong Kong. The next question is which types of extra-curricular activities are useful for sub-degree students. Further studies are required to explore the relationship between various types of extracurricular activities and deep approach.

Third, as the present study contends there is a positive relationship between deep approach and academic achievement, how can educators create a learning environment that is more conducive to the deep approach? It is argued that the learning approach students used will be affected by factors such as study habits, nature of the course content, assessment method, workload, teaching method and students' perception of the relevance of course materials and career development, interpersonal contact with peers and teachers, out-of-class learning activities and interest of the course (Gibbs, 1992; Ramsden, 1987). Stakeholders including teachers, programme administrators and curriculum developers play the key role in encouraging the deep approach in higher education.

From a practical perspective, three key points stand out. First, both teachers and education administrators should be aware that individual student characteristics affect learning approaches. There has been a developing interest in the practical treatment of individual differences. This study identifies the important influence of locus of control on learning approaches. Teachers could help students become aware of their own locus of control belief and the relations with learning approaches to promote the deep approach. Other factors relating to individual student characteristics such as socio-economic status, family structure (single-parenthood), and family involvement may also influence students' motivation to learning.

Second, educators should be aware of the relationship between learning approaches and academic achievement. Teachers can facilitate students' efforts to be flexible in their learning. Teachers can try to teach through a variety of methods such as case studies, interactive workshops, facilitated discussions and simulation exercise. Biggs (1999) suggested that the generic objective of good teaching is to encourage students to use the deep approach and to discourage the use of the surface approach. Teachers are responsible for ensuring that teaching methods and assessment are aligned to encourage the deep approach.

The way students learn may depend on their perception of the learning environment and the demands that are set upon them. Other institutional demands such as assessment methods, overloaded curriculum, and study pressure may also influence learning approaches. For example, if the overall assessment is typically focused on the reproduction of factual information, this may encourage students to adopt the surface approach to attain good results. An examination-oriented learning context encourages students to use a mix of learning approaches in order to achieve good results. Previous studies (Biggs & Watkins, 1995; Trigwell & Prosser, 1991; Watkins, 2001) revealed that the deep approach was likely to be encouraged by students' intrinsic interests in learning materials, a well-resourced learning environment, an appropriate workload and assessment methods. Students have to learn how to deal with increasing amounts of information. Different learning approaches may serve as tools for obtaining and using the necessary knowledge in a rapidly changing society. The basic idea is that students who use the deep approach in various settings are more successful while going through higher education and in their future lives.

6.3 Suggestions for Future Studies

There are a number of important issues for future research. First, further studies are needed to explore whether the relationships between learning approaches and academic achievement are found across different cultural and educational contexts. For example, Asian students are likely to believe in a direct relationship between good higher education, better job prospect and social advancement (Sue & Okazaki, 1991). Western students generally think that the purpose of higher education is to fulfill their individual goals and a vehicle for social mobility. There is scope for future research to investigate the above-mentioned relationships, collecting data from different colleges and using additional types of measures such as structured interviews. Comparative studies of students' learning approaches in different countries and cultures are needed.

Second, it is interesting to note whether the statistically derived higher-order factors, the deep and surface approaches, reflect students' 'true' experiences of their understanding of various learning approaches. This concern can be addressed by

qualitative and mixed research methods (Creswell, 2003). Other factors related to academic achievement which are not included in this study are teaching approaches, socio-economic status and differences in personality traits. A longitudinal study will be helpful to investigate consistency and variability in learning approaches.

In the light of mixed previous findings, the generalization of the relationship between deep approach and academic achievement is in need of further studies. This study is quantitative in nature. It would be useful to use qualitative research to reveal insights into the relationship between learning approaches and academic achievement in higher education. The 3P model needs to be tested with a more diverse sample of sub-degree students in different colleges before the generalization of the empirical results can be made. More studies could be taken in other Hong Kong sub-degree institutions and comparison could be considered in different learning contexts with larger sample sizes. It is expected that future studies of the types suggested would broaden and deepen our understanding of Hong Kong Chinese sub-degree student learning.

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