The adaptation, validation and application of a research instrument for investigating the relationships between students' perceptions of the learning context and students' learning patterns in post-secondary education of Hong Kong

Law, Dennis Chung-sea

The Adaptation, Validation and Application of a Research Instrument for Investigating the Relationships between Students' Perceptions of the Learning Context and Students' Learning Patterns in Post-Secondary Education of Hong Kong

Dennis Chung-sea LAW

Doctor of Education

University of Durham

2009

Table of Contents

Appendices

List of Abbreviations

AD	Associate Degree
ANOVA	Analysis of Variance
ASI	Approaches to Studying Inventory
ATI	Approaches to Teaching Inventory
CAHES	Caritas Adult and Higher Education Service
CCHES	Caritas Community and Higher Education Service
CCSSE	Community College Survey of Student Engagement
CEQ	Course Experience Questionnaire
CES	Caritas Education Services
CNAA	Council for National Academic Awards
CRQ	Centre for Research into Quality
CSEQ	College Student Experience Questionnaire
DEET	Department of Employment, Education and Training
EC	Education Committee
EDB	Education Bureau
EMB	Education and Manpower Bureau
EQM	External Quality Monitoring
GCCA	Graduate Careers Council of Australia
GCE	General Certificate of Education
GLD	Generic Level Descriptor
HD	Higher Diploma
HKCAA	Hong Kong Council for Academic Accreditation
HKCAAVQ	Hong Kong Council for Accreditation of Academic and Vocational Qualifications
HKCEE	Hong Kong Certificate of Education Examination
HKSAR	Hong Kong Special Administrative Region
HUCOM	Heads of Universities Committee
IE	Initial Evaluation
ILS	Inventory of Learning Styles
IP	Information Processing
IQM	Internal Quality Monitoring

IR	Institutional Review
IVE	Institute of Vocational Education
JQRC	Joint Quality Review Committee
LSEQ	Lingnan Student Experience Questionnaire
MANOVA	Multivariate Analysis of Variance
MSLQ	Motivated Strategies for Learning Questionnaire
NQF	National Qualifications Framework
NSS	National Student Survey
NSSE	National Survey of Student Engagement
OU	Open University
PAA	Programme Area Accreditation
PR	Periodic Review
PRV	Programme Revalidation
PV	Programme Validation
QA	Quality Assurance
QAA	Quality Assurance Agency for Higher Education
QF	Qualifications Framework
RASI	Revised Approaches to Studying Inventory
RU	Regular University
SAL	Student Approaches to Learning
SCEQ	Student Course Experience Questionnaire
SEEQ	Students' Evaluations of Educational Quality
SEM	Structural Equation Modeling
SET	Students' Evaluations of Teaching Effectiveness
SFQ	Student Feedback Questionnaire
SPQ	Study Process Questionnaire
SRL	Self-Regulated Learning
TLQPR	Teaching and Learning Quality Process Review
TQI	Teaching Quality Information
TQM	Total Quality Management
UCE	University of Central England
UGC	University Grants Committee
VET	Vocational Education and Training

List of Tables

List of Figures

Statement of Copyright

The Adaptation, Validation and Application of a Research Instrument for Investigating the Relationships between Students' Perceptions of the Learning Context and Students' Learning Patterns in Post-Secondary Education of Hong Kong

Thesis submitted for the Degree of Doctor of Education, University of Durham, 2009.

Dennis Chung-sea Law

Abstract

This thesis is about quality in post-secondary education, with its main theme being the adaptation, validation and application of a quantitative instrument for investigating student learning. While different conceptions of educational quality have been proposed and various approaches to addressing the quality issues have been practiced, it is argued that to cope with the education reform and the expansion of post-secondary education in Hong Kong, the concept of *quality as transformation* should assume a more central role, and more attention should be paid to *the student experience* in general, and *student learning* in particular. Forming the basis for the empirical investigation of this thesis is the selection and adaptation of two instruments developed and validated in western higher education contexts, namely the Course Experience Questionnaire (CEQ) and the Inventory of Learning Styles (ILS). These instruments are applied in the local response context of post-secondary education in Hong Kong. The platform of study comprised six member schools of the Caritas Community and Higher Education Service (CCHES), from which student feedback was collected on a wide range of *personological* and *contextual* observables for the validation of a composite research instrument adapted from the CEQ and the ILS, and for the initial exploration of systematic relationships among the relevant observables. Findings are that, although cultural effects manifested in their adaptation for post-secondary education in Hong Kong, the CEQ and the ILS, with further revision of some scales, should be able to serve as a basis for the design of an instrument for effective collection of students' perceptions of their learning environment and students' learning patterns in this new response context. Apart from some phenomena that need further investigation, the initial exploration of systematic relationships among the relevant observables found many results similar to those reported in other published work, in particular the central role assumed by *regulation strategies* among the ILS components.

Acknowledgements

I wish to acknowledge the individuals from whom I have received assistance during the course of the present study. First of all, a particular debt of gratitude is owed to Professor Erik Meyer, supervisor of my thesis, for his valuable advice and encouragement throughout the study. The guidance, suggestions and critical questions of Professor Meyer have helped me set the direction of the present study and address the relevant issues arising from my research, and have also contributed substantially to my thinking and writing in the process.

I am grateful to the students and staff from the six member schools of the Caritas Community and Higher Education Service who have participated or offered assistance in my survey. Their participation and assistance have provided the data that made the present study possible. Special thanks are due to Coco Ho and Mary Yiu, two students studying the Higher Diploma in Translation and Interpretation Programme at Caritas Francis Hsu College, who have helped me in the translation and back-translation of the research instrument between English and Chinese. Dr. Maureen Tam has advised me on the validation of the research instrument. My wife Anne has helped me in the data entry of the survey. I am also grateful to my colleague Louise Luk who has offered assistance in the formatting of the manuscript.

The research instrument was adapted from the Course Experience Questionnaire (CEQ) and the Inventory of Learning Styles (ILS). The intellectual rights and publication copyright in the CEQ rest with Professor Paul Ramsden, the Graduate Careers Council of Australia and the Australian Commonwealth Department of Education, Science and Training. Professor Jan Vermunt has kindly permitted me to adapt the ILS for the present study.

To all the above-mentioned people I extend my heartfelt thanks.

Declaration

I hereby declare that the work submitted in this thesis is entirely my own.

I declare that the thesis is my original work which has not been submitted for a degree in the University of Durham or any other university. In terms of publication, part of Chapter 5 of this thesis has been presented at a conference on the topic of Relationships between the Learning Strategies, Mental Models of Learning and Learning Orientations of Post-secondary Students in Hong Kong, and has been published as an article in its refereed proceedings.

1.1 Background

Like many other countries and cities, Hong Kong has been undergoing a fundamental education reform, especially in recent years, to respond to the trend of globalization and to meet the ever-changing expectations of the community in its development into a knowledge-based society. In 1998, the Education Committee (EC) of the Hong Kong Special Administrative Region (HKSAR) Government launched a comprehensive review of the overall education system in Hong Kong, covering curricula, academic structures and assessment mechanisms at various stages of education, as well as the interfaces between the different stages. In the report of the review (EC, 1999), a series of recommendations for reforming the education system were made, and the HKSAR Government endorsed their implementation in 2000. One of those recommendations is related to the expansion of post-secondary provisions and the establishment of multiple articulation pathways for the academic and vocational advancement of secondary school leavers[1]. Various issues arising from these developments are of interest in the present study, especially the quality of teaching and learning in post-secondary education of Hong Kong[2].

"In many ways Hong Kong is a microcosm for what has happened globally with respective to quality in teaching and learning in higher education[3]. All of the issues –

[1] At present, there are Secondary-5 school leavers and Secondary-7 school leavers in Hong Kong, corresponding to the two exit points of the secondary education system. After the reform of that system in the 2009/10 school year, there will only be senior secondary school leavers exiting the system, after the completion of their 6-year secondary education.

[2] For the present study, the term 'post-secondary education' broadly refers to all academic provisions for students who have completed their secondary education.

[3] Adopting the notation of some literature (e.g., Sutherland, 2002), in the present study when the term 'higher education' is used for the Hong Kong context, the focus is on the academic provisions at the

and responses to them – that have emerged in Europe, North America and Australasia are broadly reflected in the recent history of Hong Kong" (HKUGC, 2005:4). One of these issues is the expansion of degree education, as reflected in the number of *publicly funded first-year first-degree places* of which the provision was only 2% of the age cohort in the 1970s, which was increased to 9% in the 1989/90 school year and doubled to 18% by the 1994/95 school year. The publicly funded degree sector has undergone a consolidation period since then, with participation rate measured by first-year first-degree places kept at about 18%. At present, the degree sector in Hong Kong is still largely publicly funded, its major programme providers are the eight institutions advised and financed by the University Grants Committee (UGC). Apart from coping with the change to the *'3+3+4' new academic structure*[4] in the 2009/10 school year (under which the typical duration of a degree programme will be extended from three to four years), encouraging the development of the private degree sector is a priority area in the education reform.

A main target of the education reform is the increase in post-secondary education opportunities in Hong Kong, of which the statement of the policy initiatives is as follows:

> To support the progressive increase in post-secondary opportunities so that 60% of senior secondary school leavers will have access to post-secondary education by the 2010/11 school year.
>
> (EC, 2002:32)

---

degree (or upper) level.

[4] The '3+3+4' new academic structure refers to three years of junior secondary, three years of senior secondary and four years of degree education.

With the publicly funded degree participation rate kept at 18%, the development of the private degree sector, and in particular the expansion of the sub-degree sector (with *Associate Degree* and *Higher Diploma* being the main programme types for its academic provisions) are expected to be the vital means for achieving the said target. In the education reform of Hong Kong, the sub-degree sector is meant to operate mainly in *self-financing* mode in its future development. Encouraged by the above policy initiatives, the growth in sub-degree places has been phenomenal in the recent few years, with its share of the total post-secondary provisions increasing from 10% in the 2000/01 school year to slightly over 50% in the 2005/06 school year, contributing to the premature achievement of the policy target, with a participation rate of 66% being recorded in the 2005/06 school year (EMB[5], 2006). The sub-degree sector is now undergoing a consolidation period, and institutions in this sector are facing fierce competition for students. With such a rapid expansion, the quality of the sub-degree provisions is also a serious concern.

Apart from degree and sub-degree programmes, institutions in the post-secondary sector also offer vocational education and training (VET) programmes that aim to provide a different set of articulation pathways for the continuing education of secondary school leavers. *Certificate* and *Diploma* are the main programme types for the VET provisions in Hong Kong, and the Institute of Vocational Education (IVE) is a major provider of these programmes. For Secondary-5 school leavers with low achievement in public examinations, e.g. the Hong Kong Certificate of Education Examination (HKCEE) which is similar to the General Certificate of Education (GCE) O-Level Examination in the UK, the sector also provides for them the one-year foundation programme *Project Yi Jin* ('*Yi Jin*' means to proceed with perseverance) the

[5] The Education and Manpower Bureau (EMB) of the Hong Kong Special Administrative Region (HKSAR) Government was renamed as the Education Bureau (EDB) in July 2007.

completion of which is deemed as equivalent to the attainment of five passes in the HKCEE for the purposes of employment and further studies.

Central to the above-mentioned post-secondary expansion and its other developments is the proposal to set up a *qualifications framework* (QF) in Hong Kong (EMB, 2002), both to assure the quality of the various qualifications and to meet the need for more explicitness and clarity about academic standards, especially those from the two main users of the system, i.e. students and employers who want to have confidence that qualifications attest accurately to past achievement and current ability.

The QF in Hong Kong covers qualifications ranging from Secondary 3 to doctorate awarded in the mainstream, vocational and continuing education sectors. Its development has taken reference from the national qualifications frameworks (NQFs) in other countries, such as South Africa. The framework as currently implemented comprises seven levels[6], with each level being described by *generic level descriptors* (GLDs) that include recognition of the cognitive skills of critical thinking and problem solving, and the commonly applied skills of communication, information technology and numeracy. It is proposed that under the QF a qualification is to be expressed by three aspects: *title*, *level* and *credit total* (e.g., Higher Diploma in Accounting Studies, Level 4, 200 credits), with the title and level indicating the 'height', and the credit total indicating the 'depth' of the qualification. *Outcome standards* that underpin the curriculum content of qualifications and their components are the building blocks of the QF; they are expressed in terms of learning outcomes and assessment criteria and set the *minimum requirement* for awarding the corresponding credits.

[6] The proposed titles for qualifications at Levels 1 to 7 of the QF are: 1 – Certificate; 2 – Certificate; 3 – Diploma; 4 – Associate Degree, Higher Diploma; 5 – Degree; 6 – Master, Postgraduate Diploma/ Certificate and 7 – Doctorate.

The establishment of the QF "is not just made in response to the expansion of post-secondary education but also as a result of concerns, accumulated throughout past years, about the lack of standardization and consistency at the sub-degree and continuing education sectors and the absence of an overall external quality assurance framework in these sectors" (Leong and Wong, 2004:44). Its recent implementation in Hong Kong will certainly induce a significant impact on the future development of the post-secondary sector, although critiques of the NQF in other countries (e.g., Blackmur, 2004) are noteworthy.

1.2 Increasing Concerns for Quality in Post-Secondary Education in Kong Hong

With the rapid expansion of the post-secondary education in Hong Kong (in particular the sub-degree sector), it has become necessary to address the question of *quality* of the academic provisions concerned, and whether it is sacrificed for *quantity*. There is now a broader mix of students entering post-secondary education in terms of their socio-cultural and academic backgrounds, abilities, expectations and aspirations. The volume and diversity of this student body inevitably impose different kinds of challenges on educational institutions, especially during such a time of education reform when both the secondary education sector and the university sector are undergoing structural changes.

Globalization has provided a rationale for restructuring the post-secondary education system in Hong Kong, mainly to meet the need for a workforce that is equipped with not only the traditional disciplinary knowledge and skills, but also a broad range of general capabilities (cf. the GLDs of the QF). However, in common with many other parts of the world, the restructuring has in fact resulted in a shift that emphasizes the vocational relevance of education and the students' *operational competence* for the world of work (Barnett, 1997), and a trend that favors the discourses about *privatization, marketization, commodification, managerialism* and *performativity* (Blackmore, 2002; Peters, 2004). The recent industrialization of the language for education, through which students become 'customers' or 'consumers', the curricula are not taught but 'delivered', aims and objectives of courses are changed to 'learning outcomes', and understanding and knowledge are replaced by 'competence' and 'information' respectively, has also risked the downgrading of certain key values within education (Coffield and Williamson, 1997), and the transforming of education into a market place where the model of transactional deals between traders may tend to overshadow the implicit moral obligation of educational practices that strive to enable individuals to realize their potentials (Gibbs, 2001). Apart from the influence of economic globalism, the rise of techno-science, the increasing demand for access to post-secondary education and its consequent pressure on public expenditure and, (from the postmodern perspective) the decline of the legitimating meta-narrative, have all contributed to changes in education. These changes result in formidable external demands for quality assurance (QA), especially those from government agencies, that are described by some as being ostensibly about the maintenance of excellence but fundamentally about accountability and control (e.g., Harker, 1995:37).

There is now consensus that the nature of educational quality is *contestable* (Harvey and Green, 1993; Tam, 2001a; Van Kemenade *et al.*, 2008) and that there is always a tension between *accountability* and *improvement* in the quality endeavor (Harvey and Knight, 1996). Middlehurst (1997) views the different concepts of quality as forming a spectrum, and opines that most of the national (and local) effort that is expended on quality is focused on the accountability/assurance end of the spectrum rather than the improvement/change end (p.51). She also points out the flaws in the belief that if accountability is demonstrated then improvement will follow. As contended by her, a major flaw of this belief is the assumption of a necessary relationship between accountability and improvement, which is incorrect since they each serve a range of different purposes and interests, some of which are likely to be in conflict with each other (p.51). Another major flaw is the assumption that the motivations that drive individuals and institutions to be 'accountable' in response to the interest of stakeholders are the same as those that drive improvements in practice, which is again incorrect since accountability as currently practiced relies largely on extrinsic motivation (p.53) but, in sharp contrast, effective and sustained improvement tends to rely on intrinsic motivation, often linked to notions of professionalism (p.54).

With the above-mentioned issues as the backdrop, it is imperative to review the current QA policies for post-secondary education in Hong Kong, and to explore practical ways to help shift the focus of the quality endeavor towards the improvement end of the quality spectrum.

1.3 Quality Assurance Policies for Post-Secondary Education in Hong Kong

In the education reform of Hong Kong, QA is suggested as the cornerstone of the education system. While it is agreed that educational institutions should assume the primary responsibility for the quality of their programmes, the HKSAR Government in formulating the QA policies for post-secondary education, considers it essential to "put in place an effective and credible QA system to safeguard the standards of our programmes, ensure that students are receiving the education they need, and that the qualifications they obtain will be valued for the purposes of employment and further studies" (EMB, 2006:33).

Early discussion and information on the development of the said QA policies and their related issues can be found in the relevant literature, such as Tam (1999a), Leong and Wong (2004), EMB (2006) and EDB (2008). However, there are recent changes to these policies and their associated QA mechanisms, most notable those in relation to the introduction of the QF that was officially launched in May 2008 in Hong Kong (e.g., HKCAAVQ[7], 2008a, 2008b).

In general, "all local post-secondary programmes are required to undergo QA before they can be offered in Hong Kong. In view of the different background and level of maturity of the institutions, two QA mechanisms co-exist in Hong Kong" (EDB, 2008:15). The first QA mechanism applies to institutions with *self-accrediting status* (e.g., the UGC-funded institutions such as universities). Both the publicly funded programmes and the self-financing programmes offered by these institutions are mainly subject to the internal QA procedures stipulated by the institutions concerned. It is worth noting that in addition to internal QA, the UGC has since 1996 implemented the Teaching and Learning Quality Process Review (TLQPR) exercises for its member institutions. The focus of these exercises is the institutions' teaching and learning QA processes, and the appropriateness and adequacy of these processes for actually

[7] The Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ) was formerly known as the Hong Kong Council for Academic Accreditation (HKCAA). The HKCAA was renamed as the HKCAAVQ in October 2007, mainly to reflect the expanded scope of its remit.

implementing and improving the quality of teaching and learning (Massy 1997; Massy and French, 2001)[8].

The TLQPR is explicitly derived from the original *audit* (or *quality-process review)* practiced in the UK in the early 1990s (HKUGC, 2005:8), which is one of the common approaches to external quality monitoring (EQM), whose methodologies typically comprise elements of *self-assessment*, *peer view* and *performance indicators* for different purposes (Dill, 2000; Harvey and Newton, 2004). Unlike the other EQM approaches such as *accreditation* or *assessment*, audit focuses on *processes* rather than *products* and is founded on the following principle:

> That good people working with sufficient resources and according to good processes will produce good results, but that faulty processes will prevent even good people and plentiful resources from producing optimal outcomes.
>
> (Massy as cited in Tam, 1999a:223)

Audit can therefore reduce the complexity of the self-assessment conducted by the institution, and the peer view conducted by the visiting panel, with the assumption that good external and internal QA will eventually lead to good learning outcomes.

The second QA mechanism applies to *non-self-accrediting* institutions (i.e. the private programme providers). For external quality monitoring, the academic provisions of these institutions are subject to the QA exercises of the Hong Kong Council for Accreditation of Academic and Vocational Qualifications (HKCAAVQ). The HKCAAVQ was set up in 1990 and was patterned after its counterpart in the UK at that

[8] Besides the TLQPR exercises, the UGC also conducts periodic Management Reviews and Research Assessment Exercises for its member institutions.

time, the Council for National Academic Awards (CNAA)[9]. Originally, the remit of the HKCAAVQ was to provide authoritative advice to the government on the standards of degree programmes in non-self-accrediting institutions. With the education reform and the introduction of the QF, the range of programmes to be monitored by the HKCAAVQ has been extended to other post-secondary and vocational ones.

The original QA exercises of the HKCAAVQ comprise mainly *Institutional Review (IR)* and *Programme Validation (PV)* (and their periodic counterparts such as *Programme Revalidation, PRV*) that are based on the *accreditation* model of EQM. The primary aim of these exercises is to determine whether an institution or a programme meets *threshold quality criteria*, and they also serve a function of *certification* and therefore unlike audit-based exercises (e.g., the TLQPR) that focus only on processes, the focus of IR and PV/PRV is more comprehensive, encompassing mission, resources, internal QA procedures and other relevant aspects of the institution or programme.

With the introduction of the QF, the HKCAAVQ has recently introduced a four-stage QA process to replace the old IR/PV/PRV approach. The new QA process comprises four stages: *Initial Evaluation (IE)*, *PV (and PRV)*, *Programme Area Accreditation (PAA)* and *Periodic Review (PR)*. As the first stage, IE aims to assess if programme providers have the institutional competency to effectively manage and provide adequate resources to the development, delivery, assessment and quality assurance of their learning programmes and educational services (HKCAAVQ, 2008b:3), and it can be considered as a variant of the IR. While PV and PRV form the second stage of the new process for accreditation of individual programmes, at the third stage PAA provides opportunities for programme providers to seek accreditation for their abilities to develop and offer

[9] In the UK, the Council for National Academic Awards (CNAA) has now become the Quality Assurance Agency for Higher Education (QAA).

programmes in specific programme areas. Success in a PAA exercise enables the provider to enjoy self-accrediting status similar to UGC-funded institutions, but only limited to the relevant programme area and within the specified timeframe. As the final stage, PR is a periodic monitoring and external review exercise for all programme providers with valid PAA statuses. A provider has to pass the periodic PR in order to maintain its PAA status, and to a large extent PR can be considered as similar to the TLQPR, but with its areas of interest not limited to teaching and learning. It is noteworthy that under this new QA process, private programme providers with the relevant track records are now able to avoid the complexity of conducting EQM on a per-programme basis, by achieving and maintaining PAA statuses in the relevant programme areas.

It is also worth mentioning that the current QA policies have resulted in a concern about an *uneven playing ground* in the post-secondary education sector of Hong Kong, as the *self-financing arms* of the UGC-funded institutions (i.e. their continuing education or community education extensions that mainly offer sub-degree and VET programmes) are effectively granted self-accrediting status for their programmes. Such an arrangement does not have sufficient supportive evidence, but clearly places the institutions concerned in an advantaged position in competition with the private providers. For external quality monitoring, the Heads of Universities Committee (HUCOM) established the Joint Quality Review Committee (JQRC) in August 2005 to oversee the QA matters of the self-financing post-secondary programmes offered by the UGC-funded institutions and their self-financing arms. As a result, the HKCAAVQ and the JQRC are now the two main QA agencies in Hong Kong. However, unlike the four-stage QA process of the HKCAAVQ (of which the first three stages are accreditation-based and only the last stage is audit-based), the EQM approach of the JQRC is largely audit-based, which provides another source for the criticism of unequal treatment among programme providers.

1.4 Importance of Student Feedback on Educational Quality

It can be argued that the QA policies for post-secondary education in Hong Kong and their associated EQM processes, as currently implemented, still lean more towards the accountability end rather than the improvement end of the quality spectrum. In particular, insufficient attention has been paid to the role of *the student experience* in the quality endeavor. Studies of EQM in other parts of the world, such as the UK, also reinforce the view that in most practice "compliance and accountability have been the dominant purposes and any improvement element has been secondary" (Harvey and Newton, 2004:152). It is also noteworthy that as a significant mechanism underpinning the QA policies of many countries and cities, EQM has been subject to various complaints, the most notable ones being its doubtful validity (especially in view of its pre-specified methodology with epistemological aspects being overwhelmed by political rationale), and its creation of quality bureaucratization that leads to unjustified workload burdens.

In line with Yorke's (1994:9) suggestion for an enhancement-led QA approach in higher education through "a greater degree of reliance on self-regulation in the system coupled with a relatively 'light' external monitoring system", Harvey and Newton (2004) advocate an *evidence-based, research-informed,* and *enhancement-led* approach to EQM, where a transformation of quality evaluation is suggested in the direction of enhancement of the student experience and creation of conditions for bringing about sustained changes and improvements in educational institutions (p.159). In discussing the transformation of higher education, Tam (1999b) argues that the re-conceptualization of the learning process is central to such a transformation, and in its main part this involves teachers' rethinking and modifying their educational beliefs and values, and teachers' constantly thinking how students learn and what is the best way of teaching them (p.228).

In her discussion of quality in higher education, Tam (2001a) opines that the central activity of higher education is the maximization of student's educational development, and that the continuing improvement to maximize student learning and development should be the primary goal of universities, and should also be the focus of any concern over quality in higher education and its measurement (p.53). Such arguments can also apply to the non-degree part of post-secondary education in Hong Kong, where the quality of the student experience (in particular that related to student learning) is of paramount importance, in view of the various learning problems that post-secondary students may bring over from their secondary education.

The above perspectives suggest the need to sustain a focus on the student experience in the quality endeavor, and in this regard the development of an evidence-based, research-informed, and enhancement-led approach[10] to collecting and using students' feedback on their experiences is imperative. Student feedback can be defined broadly as obtaining information about student satisfaction with specific programmes/units or services, student views about whether their objectives have been met, and student accounts of their learning and study methods (Brennan *et al.*, 2004:45). With such a

[10] This is meant to extend Harvey and Newton's (2004) suggestion for transforming EQM to that for transforming the internal QA processes of educational institutions, especially those related to teaching and learning.

broad range of information that can be collected and utilized, the author opines that the focus should be placed on the relevant aspects of *student learning*, which is considered by many as the 'heart of quality' in education and training (Carmichael *et al.*, 2001).

Another focus of the present study is placed on quantitative instruments for obtaining student feedback (Leckey and Neill, 2001; Harvey, 2003) as, despite the fact that these instruments are commonly used in educational institutions, few of them have undergone a rigorous design process (Richardson, 2005a) thereby jeopardizing their credibility for QA purposes (Rowley, 1995). In view of this, the author considers it important to establish through empirical research the *validity* and *reliability* of instruments, before they are used for obtaining student feedback.

1.5 Research Questions

With the rapid expansion of the post-secondary education sector of Hong Kong in its education reform, the question of how students engage in learning, and with what likely consequences, is an important consideration for various stakeholders. One well established methodology for addressing this question lies in the development of appropriate research instruments for capturing variation in students' educational experiences, and particularly their perceptions of the learning context and their experiences and conceptualizations of learning insofar as these can inform endeavors aimed at enhancing the quality of both teaching and learning.

A main theme of the present research is the development and validation of a quantitative instrument for investigating student learning, with the expectation that through further development such an instrument can form an important basis for a QA system to inform appropriate actions in the quality endeavor. However, it should be noted that the complexity of the phenomena related to student learning (Richardson, 2000; Meyer, 2004a) renders the need for a practical investigative project to address only a limited set of constructs as the explanatory sources of commonality and variation among students (e.g., Meyer, 1999; Vermetten *et al.*, 1999a).

In determining the research direction of the present study, the author is in agreement with the approach suggested by Vermunt and Vermetten (2004) to increase the integration of the existing constructs of student learning, with a focus on the cognitive, regulative, metacognitive and motivational components and their relationships, so as to contribute to the development of the second generation of conceptualizations of student learning (p.361). On the other hand, the author also accepts that there are other aspects that are influential in student learning, with student perception of the learning context being an important one that should not be left out in a research endeavor. The scope of the present research is therefore set to address the issues related to these two considerations, with three main research questions as follows:

1. *Can research instruments developed for higher education in western contexts be applicable to post-secondary education in Hong Kong?*

In the comprehensive design of a research instrument, some researchers have adopted a *two-step approach* where, in the first step, interviews and other qualitative analyses are conducted to collect responses from students and teachers on their experiences, perceptions and conceptualizations of the phenomena under investigation. In the second step the descriptive categories derived from the qualitative analyses are transformed into instrument items, which are then psychometrically refined to develop a structured research instrument that will yield data for quantitative analyses (e.g., Vermunt, 1996, 1998; Meyer, 2004b; Trigwell and Prosser, 2004).

However, the adoption of such a two-step approach usually involves a lengthy process, typically lasting several years, in the testing and fine-tuning of the instrument items. It is therefore considered unsuitable for an educational research endeavor like the present study. The author has thus decided to exploit the results of published work, by adapting appropriate instruments that have been validated and used in other contexts, for research in the local context of post-secondary education in Hong Kong. In this regard two instruments, the Course Experience Questionnaire (CEQ) and the Inventory of Learning Styles (ILS), have been chosen for adaptation. The CEQ was developed in the UK higher education sector and has been used in the national graduate survey of Australia since 1993. The ILS was developed in the Dutch higher education sector and has been widely used in a number of studies, mainly in western contexts. The applicability of the composite research instrument adapted from the CEQ and the ILS for the local context, and the issues arising from this adaptation, form an important investigative area for the present study.

2. *What are the relationships between the different components in students' learning patterns in post-secondary education of Hong Kong?*

The constructs of student learning selected for investigation in the present study can broadly be classified into two domains: the *personological* domain and the *contextual* domain. The personological domain refers to constructs internal to the students that are influential in their learning, and an important part of which are the cognitive, regulative, metacognitive and motivational components in students' learning patterns. In the present research these learning components are operationalized by the ILS. An important research focus for the present study is placed on the relationships between these components in the local context of post-secondary education in Hong Kong, and in particular verification of the hypothetical model of Vermunt (1998) in which *regulation strategies* assume a central and vital position in the interrelationships among the learning components.

3. *What are the relationships between students' perceptions of the learning context and their learning patterns in post-secondary education of Hong Kong?*

The contextual domain refers to the constructs external to the students that are influential in their learning, such as students' perceptions of the learning context. In the present research these perceptions are operationalized by the CEQ. An important research focus for the present study is placed on the investigation of relationships between students' perceptions and their learning patterns, and comparison of the investigative results with those of other published work.

1.6 Structure of the Thesis

Chapter 1 (this chapter) provides the background of the present research by means of an overview of the post-secondary education system in Hong Kong and its associated QA policies, and argues that a focus of the quality endeavor should be the utilization of appropriate instruments for capturing variation in student learning. Chapter 2 provides a review of the relevant literature to establish a coherent reference framework that frames the investigative direction of the present study. Chapter 3 discusses the adaptation of the instrument for the present research from the CEQ and the ILS, as well as the general design of the empirical investigation used in the present study and its limitations. Chapter 4 presents the results of validating the research instrument in the local response context, and discusses the issues identified in the validation process. Chapter 5 presents the results of the initial exploration for systematic relationships among the relevant constructs in the personological and contextual domains that are of interest in the present study, and compares them to the findings of other published work. Chapter 6 concludes the present study by summarizing the major findings of the research undertaken, and discusses possible directions for future development.

2.1 Introduction

This thesis is about the investigation into students' perceptions of their learning context and students' learning patterns in post-secondary education of Hong Kong. Core ideas relating to these investigative areas include the concept of educational quality and its contestable nature, the major means being proposed for addressing the quality issues, the suggestion by many researchers for the need to focus on students' experiences in the quality endeavor, the different manifestations of students' experiences that are related to different aspects of quality, and the development of effective instruments for soliciting students' feedback on their experiences, especially those related to their learning. This chapter, although not meant to be exhaustive, is a review of the relevant literature with an attempt to establish from these core ideas a coherent reference framework that sets the background and guides the investigative direction of the present study.

2.2 Educational Quality

A key element of the education reforms in both the local and international contexts is the emphasis on the pursuit of educational quality, for which different models and approaches have been proposed. For example, based on the transfer of management theory to the field of education, Cheng and Tam (1997) introduce a set of seven models, namely a *goal and specification model*, a *resource input model*, a *process model*, a *satisfaction model*, a *legitimacy model*, an *absence of problems model* and an *organizational learning model*, as a comprehensive reference framework for understanding the complex nature of educational quality and guiding the development of management strategies for its achievement. In reviewing the contemporary approaches for assuring quality in colleges and universities, Bogue (1998) identifies four main streams of activity, namely *accreditation and programme reviews* which embrace the principles of peer review and external standards, the *assessment-and-outcome movement* which calls for the development of performance evidence and attention to value-added questions, *total quality management* which focuses on the principles of continuous improvement and customer satisfaction, and *accountability and performance indicator reporting* which address the monitoring function and the increasing demand for transparency in quality issues. Bogue argues that the nurturing of quality in colleges and universities must go beyond the conceptual and technical responsibilities as implied by these approaches, towards the development of *a community of care* for uniting the systemic and personal dimensions of quality assurance to address the moral and ethical aspects of quality; similar arguments are made by some researchers in investigating the importance of social context to school effectiveness (e.g., Battistich *et al.*, 1997; Tinto, 1997; Juvonen, 2007).

To better understand the nature of educational quality in the context of post-secondary education, a good starting point should be the review of researchers' efforts in searching for a working definition of *quality*, a concept considered by many as highly contestable and stakeholder-relative (e.g., Tam, 2001a, 2001b). The concept of quality is found to be multifaceted and value-laden, and various stakeholders who represent key groups in society, including government, employers and the professions, students and staff, the management of the educational institutions and the general public, place emphasis on different dimensions of the concept. In this regard, an education system can be seen as "a negotiated order in which the interests of different groups in society for education, training and research struggle for power and acceptance" (Williamson and Coffield, 1997:123).

As an important attempt at defining educational quality, the analytical framework proposed in Harvey and Green (1993) and further elaborated in Harvey and Knight (1996) is worth noting. Under this framework, the concept of quality in relation to post-secondary education can be viewed from the following perspectives:

(a) Quality as *exceptional*, which is the traditional concept usually operationalized as exceptionally high standards of academic achievements;

(b) Quality as *perfection (or consistency)*, which focuses on processes and their specifications and is related to the ideas of *zero defects* and *getting things right first time*;

(c) Quality as *fitness for purpose*, which judges the quality of a product or service in terms of the extent to which its stated purpose is met;

(d) Quality as *value for money*, which assesses quality in terms of return on investment or expenditure and is related to the notion of *accountability*; and

(e) Quality as *transformation*, which sees quality as a process of change with emphasis on adding value to students through their learning experience.

Among the different concepts of quality within the framework, Harvey argues that transformation is a meta-quality concept and that the other concepts are "possible (although not very good) operationalisations of the transformative process, rather than ends in themselves" (Harvey, 2002a:252). Moreover, he suggests that "in an era of mass higher education, value-added transformation ought to become the central element of any concept of quality rather than excellence, fitness for purpose or value for money" (Harvey, 2002b:20). A small-scale research study with a sample of senior managers in higher education institutions in the UK conducted by Lomas (2002) reveals that fitness for purpose and transformation are considered as the two most appropriate definitions of quality. In Hong Kong, fitness for purpose is employed as a guiding principle in external quality monitoring by quality assurance agencies (e.g., HKCAAVQ, 2008a, 2008b).

2.3 Common Approaches to Addressing Educational Quality Issues

Various approaches have been proposed for addressing the issues of quality in post-secondary education. In this section, the development and relevant issues of three commonly adopted approaches, namely *total quality management*, *performance indicators* and *external quality monitoring* are briefly reviewed.

2.3.1 Total Quality Management

Total quality management (TQM) is a product of the market ideologies of the 1980s and the managerialism that accompanied them (Williams, 1993:229). Its introduction into the educational context (especially post-secondary education) was an attempt to emulate the quality success found in some industrial and commercial settings (Harvey, 1995:123), to enable the institutions to cope with the increasing financial pressures and the fierce competition in the sector as a result of education reform. Many higher education institutions in developed countries such as the US and the UK have tried out the TQM (e.g., Koch and Fisher, 1998; Kanji and Bin Al Tambi, 1999; Grant *et al.*, 2002). However, empirical support for its successful applications are mainly found in non-academic activities such as registration, physical plant, bill paying and purchasing, but not in core academic activities, especially teaching and learning. It is now generally agreed that despite the enthusiasm in industry, the impact of TQM in higher education is small (Koch, 2003), mainly due to the misfit of its relevant features (Houston, 2007).

Although there is no single authoritative definition of TQM, a number of relevant features can be found in most approaches inspired by it, including *constant quality improvement* as a never-ending goal, *cultural change* within the organization, *customer-driven* definitions of quality, the concept of *quality chain* for the production or service process where at each point there is a customer-supplier relationship, quality being *built-in* at each stage of the process (instead of being controlled at the final stage) and its improvement being assisted by *statistical techniques*, and the encouragement of *organization-wide involvement in quality* via team work, and *management commitment to quality* via appropriate organizational structure (cf. Harvey, 1995: 124-125).

As pointed out by Harvey (1995), at the heart of TQM is a concept of customer receiving a product, where the quality of the product is defined by customers, and improved through reduction in variation. With its key ideas originated from the industrial sector, TQM has not been transplanted easily to the service sector. Its transplantation to the education sector is even more problematic, as the notion of customer in this sector is illusive, even if it is still appropriate (e.g., Lomas, 2007). In fact, as mentioned in Section 2.2, the concept of educational quality is not defined by a single group of *customers*, but is affected by the requirements of different *stakeholders* and the nature and purposes of the education concerned. TQM also fails to address the *transformation* and *student-participative* nature of education, its emphasis on reduction in variation (i.e. *consistency*) is desirable for mass-production of components or customer products, but does not fit the *exploratory* nature of student learning.

Houston (2007) suggests that the application of TQM in higher education involves a clash of metaphors, as TQM in its common practice is an instrument for enacting the *machine metaphor* of the organization, which has fundamental differences with the nature of academic culture that is underpinned by values such as *academic freedom*, *collegiality* and *professionalism* (Koch, 2003). Overall, while some researchers still base a constituent part of their quality models on TQM (e.g., Srikanthan and Dalrymple, 2002, 2005), it seems highly probable that TQM and other business-oriented approaches such as the *Business Excellence Models* that are inspired by TQM-related concepts (e.g., Kanji and Bin Al Tambi, 1999; Pires da Rosa *et al.*, 2001) will not have significant influence on the mainstream concepts and practices of educational quality.

2.3.2 Performance Indicators

Amid the education reform around the world, performance indicators have gradually become standard components of the language of educational quality. From a theoretical point of view, the development of indicators in the educational context is affected by the ideas of empiricists such as W. E. Deming who asserts that quality cannot be improved unless measured (Deming, 1986; Dill, 1995:95), and the ideas of researchers such as C. T. Fitz-Gibbon who suggests that education is a highly complex system, and to get quality into it "the best strategy lies in improving the information in the system, particularly by defining and measuring the many outcomes that we care about and feeding back the measurements to the units of responsibility" (Fitz-Gibbon, 1996:4). In reality, the use of indicators has been fuelled by an increasing concern on *accountability*, mainly on the part of government agencies and ministerial officials who are responsible for ascertaining the appropriate delivery of educational service at an affordable cost. It is also affected by a concern on the *transparency* of institutional performance, as one supposed reason for the failure of a competitive market is that consumers may have insufficient information and therefore cannot make efficient choices. Such a concern has motivated the formulation of quality policies to require an appropriate revelation of academic quality information to the public, and this requirement is expected to also motivate educational institutions to maintain and improve the quality of their provisions.

A performance indicator can generally be defined as "an item of information collected at regular intervals to track the performance of a system" (Fitz-Gibbon, 1996:5). For real-life implementation of the idea, it is worth noting that in a recent review in the UK higher education sector (HEFCE, 2007), indicators being used or proposed include those relating to widening participation (e.g., indicators of students' social class and parental education), student progression (e.g., indicators of students' *non-continuation from first year* and *return after year out*) and proxies of educational outcomes (e.g., indicators of graduates' employment and job quality). In the post-secondary education sector of Hong Kong, although formal policies have not yet been formulated, educational institutions are increasingly required to provide relevant information for public consumption, such as their student-staff ratios and the percentage of their students being involved in employment and further studies immediately after graduation. Viewed from the *input-process-output paradigm* of an education system that is commonly used in school effectiveness research (Teddlie and Reynolds, 2000), the use of these indicators can be criticized for their lack of appropriate regard to the relevant aspects of the educational process or outcomes, especially those relating to student development which are arguably the most important measures of educational quality.

Yorke (1998) analyses a number of indicators relating to student development, including students' entry and exit performances (and the associated concept of *value-added*), teaching quality, student retention and completion, as well as graduate placement in employment, and raises concern about the trustworthiness of these indicators from the perspectives of fitness for purpose, validity, reliability and possible side effect (i.e. concerns on an indicator's *corruptibility* and potential for leading to *perverse behaviors*). Desirable characteristics of performance indicator, such as relevancy, communicability, resistance to manipulation, economy of data collection and processing, and potential for beneficial behavioral implications, have been proposed in some research literature (e.g., Yorke, 1995:15-16; Fitz-Gibbon, 1996:160-164). However, most indicators currently being used are only *proxy measures* of vital educational processes or outcomes, and they do not exhibit all the desirable characteristics. Besides the problems inherited from the contestable and stakeholder-relative nature of educational quality, there are other theoretical and technical difficulties in the development of good indicators, such as the problems associated with appropriate outcome assessment (Knight, 2002) and fair comparison (Saunders, 1999). Also, as pointed out by Yorke (1998), due to the range of interests that are being brought to bear on the performance of the education system, "performance indicators cannot be construed in value-neutral terms, or as mere management statistics". "They exist in political arenas of varying levels of inclusivity...and may be used for purposes for which they were not designed". "For this reason (amongst others), the interpretation of a performance indicator is very much open to contest" (p.45-46).

Yorke (1995, 1998) examines the inherent retrospective/prospective duality (i.e. accountability purposes vs. enhancement purposes) of performance indicators, and argues that more attention should be paid to developing indicators for the *enhancement* purposes of educational quality. The current focus in the development of performance indicators is in fact placed on *accountability* purposes; however some researchers argue that the indicators currently being employed are still too crude to serve as the primary vehicle for achieving accountability (e.g., Massy, 1997:251). Nevertheless, it seems likely that the refinement of most indicators to the level of accuracy that all researchers desire will not be technically feasible or economically justifiable. Given the imprecision of performance indicators, the problem of error in their measurement and the possibility of partiality in their use should not be underestimated.

Despite the unavoidable inadequacies of performance indicators, it is believed that under suitable arrangements their employment in the quality endeavor can still be fruitful. An example of such an arrangement is proposed by Yorke (1996) which views an education system as a nested set of levels, with the higher levels (e.g., the system or the institution) being more responsible for the accountability aspect of educational quality, and the lower levels (e.g., the programme or the course) more responsible for the enhancement aspect. As suggested by Yorke (1998), when one moves from the higher levels towards the lower levels, the indicators that are of importance change and they also tend to get *softer*, i.e. they are much more subjective and are related to student experience such as the quality of teaching and learning and student satisfaction (p.57). Under this perspective, indicator data should be evaluated and acted upon at the lowest level possible, and higher levels are expected to audit whether the data have been obtained and acted upon in an appropriate manner (p.58).

York (1995) also argues that to be effective in measuring and improving educational quality, "it is not the performance indicators that constitute the primary problem (despite their technical inadequacies), but the context in which they may be used" (p.18). Overall, for fruitful employment of performance indicators in the quality endeavor, more work needs to be done to improve the *indicator data* with respect to its surrounding theoretical, technical and socio-political issues, to balance the *indicator purpose* between external accountability and quality enhancement, and to develop appropriate frameworks for *indicator usage*.

2.3.3 External Quality Monitoring

With drastic changes currently taking place in post-secondary education worldwide, external quality monitoring (EQM) has grown rapidly and has become a crucial part of the dominant model of *delegated accountability* through which quality is used to legitimate policy (Harvey and Knight, 1996:86). It also represents a shift from quantitative indicators to qualitative evaluations, in part reflecting a growing awareness of the need for placing a higher priority on quality enhancement (p.88).

The relevant literature (e.g., Dill, 2000; Harvey and Newton, 2004) suggests that there are currently three major approaches to EQM, i.e. *accreditation*, *assessment* and *audit* (or *quality-process review*), which are usually conducted by quality assurance agencies. From the *principal-agent* perspective (Dill, 1995:100; Hoecht, 2006:558), these agencies serve as *agents* that supposedly work on behalf of the public interest (i.e. the *principals*) to monitor the institutions and safeguard the quality of provisions in an education sector. In its typical form, accreditation determines whether an institution or a programme meets *threshold quality criteria* for the offering of a license to operate, and its focus is usually more comprehensive than the other two approaches, encompassing the mission, resources and relevant processes of the institution or programme. The major aim of assessment is to pass a *graded judgment* on academic quality levels rather than making a binary decision relative to threshold standards, and its focus is usually placed on delivered performance at the subject or programme level. Unlike assessment, the focus of audit is not the quality of academic deliveries, but "the processes that are believed to produce quality and the methods by which institutions, faculties and departments assure themselves that quality has been attained" (Massy, 1997:253). These processes and methods are later developed as the concept of *education quality work* that assumes a key role in the Teaching and Learning Quality Process Review (TLQPR) of the universities in Hong Kong (Massy, 2001; Massy and French, 2001; HKUGC, 2005). Although different in their purposes and focuses, the three EQM approaches adopt common methodologies whose core elements include *self-assessment* by the institutions, followed by *peer review* in the form of panel visits, and supported by *statistical or performance indicators*.

A major purpose of EQM (and the corresponding internal quality monitoring, IQM) should be to act as catalysts for internal improvement within institutions; however, in the current implementation "compliance and accountability have been the dominant purposes and any improvement element has been secondary" (Harvey and Newton, 2004:152). In her impact study on student learning, Horsburgh (1999) identifies the elements contributing to *quality as transformation* and constructs a framework that structures her observations, interviews and document reviews. She finds that "quality monitoring processes had quite a narrow impact, and were not concerned with the complexity of a whole teaching programme, or issues such as leadership or the culture in which students learn" (p.21), and that "the greatest impact on student learning was the curriculum, factors that influence the curriculum, and the teachers", and "the most direct impact on student learning was from teacher practices, how they help students learn and the assessment practices they employed" (p.23). However, in a discussion between representatives of quality assurance agencies reported in Harvey (2006), the main impacts of EQM identified include changes evident from one review to the next, improvements in performance indicators, adoption of formal internal quality processes by institutions, student feedback indicating positive changes and employer perceptions about the improvement in graduate abilities. Nevertheless, Harvey notes that "the views expressed by the group come from an agency perspective and they tended not to address the main complaints from the sector" (p.289). Such complaints against EQM (e.g., Harvey, 2002b, 2004; Anderson, 2006; Hoecht, 2006) include its doubtful validity (especially in view of its pre-specified methodology with epistemological aspects being overwhelmed by political rationale), its creation of quality bureaucratization that leads to unjustified workload burdens, its positive impact being superficial and impermanent, and the skepticism on its underlying intention of management control and a shift of power that impinges on academic freedom. With these complaints not being appropriately addressed, it is clear that many academics will tend to treat quality monitoring processes as *game-playing*, and quality assurance systems as *beasts to be fed* (Newton, 2000) through ritualistic and largely meaningless practices.

The foregoing discussion suggests that more studies are needed to investigate the politics of quality (Lemaitre, 2002) and the power relations in quality assurance (Morley, 2003). In regard to the micro-politics of quality monitoring, the close-up studies of Newton (2000, 2002, 2003) are worth noting. Based on qualitative data from semi-structured interviews with both frontline staff and academic managers (i.e. the *managed* vs. the *manager*), a main theme of these studies is the implementation gap of quality policy resulting from the tension between quality at the level of management objectives and quality as manifested at the operational level through the activities of frontline staff. Newton identifies the factors influencing the implementation of quality strategies (e.g., *the loss of frontline academics' autonomy* and *the bureaucratization of teaching*), and argues that situational factors and context are crucial in quality development. In deconstructing the concept of quality, he compares the dominant formal meanings as suggested in the field (cf. Section 2.2) with the situated perceptions of the frontline staff (e.g., quality as *impression management*, and quality as *a culture of getting by*). Newton also studies the behavioral responses of academics to quality policy (e.g., *sinking*, *coping* and *reconstructing*), and suggests that academics are not passive recipients of management objectives, but in fact makers and shapers of the policy. He argues that if academics are to remain pivotal in efforts to improve the quality of teaching and learning, more attention needs to be paid to their subjectivities and to the importance of the conditions and context of their work.

To seek improvement in the practice from a more macroscopic perspective, Harvey and Newton (2004) suggest that for quality monitoring to be transformed to make it transforming, attention should be focused on internal processes and motivators, and instead of politically acceptable methods, appropriate research methodologies should be adopted. Jones and De Saram (2005) argue that useful changes can be introduced through focusing on a philosophy of a lean system, building adaptability into the system to facilitate the translation of a minimal set of overall requirements into activities, tolerating the breaking of rules in rational and well-intended ways to optimize intended outcomes, and developing a culture of trust between staff and management.

2.4 Centrality of The Student Experience

It should be noted that a common concern about the current implementation of the quality approaches reported in Section 2.3 is their insufficient attention to the student experience of the teaching and learning process. In relation to this concern, a major focus of the recent research into educational quality is *the centrality of the student experience* as suggested by M. Tam:

> Any measurement of quality and performance evaluation in higher education that falls short of the centrality of student's experience (sic) is bound to be peripheral and fail to provide information about how students find the experience and how much they are learning and progressing both intelligently and emotionally throughout their years in university.
>
> (Tam, 2001a:53; also cited in Harvey, 2002a:255)

With such a focus, there are different approaches to investigating students' experiences from various perspectives, including some sub-fields of the general research into school effectiveness and school improvement (e.g., Willms, 1992/2002; Fitz-Gibbon, 1996; Teddlie and Reynolds, 2000), students' evaluations of teaching effectiveness (e.g., Marsh, 1987; Wachtel, 1998), students' experiences of their programmes (e.g., Ramsden, 1991a, 1991b; Yorke, 1996), students' total experience as learners (e.g., Pascarella and Terenzini, 1991, 1998, 2005; Cheng, 2001; Kuh, 2001a, 2001b; Tam, 2001b; Zhao and Kuh, 2004), students' satisfaction with their experience (e.g., Rowley, 1996; Wiers-Jenssen *et al.*, 2002), students' progress and attrition (e.g., Tinto, 1993, 2005; Yorke, 2000; Danaher *et al.*, 2008), first-year students' perceptions and experiences (e.g., Lizzio and Wilson, 2004; Rhodes and Nevill, 2004; Reason *et al.*, 2007) and the research into the complex phenomena relating to student learning (e.g., Biggs, 1987; Meyer and Muller, 1990; Meyer and Watson, 1991; Richardson, 2000). In reviewing these approaches, the author agrees with the argument that *student learning* should be placed at the heart of educational quality (Carmichael *et al.*, 2001), especially in view of the current need for many institutions to focus their resources on key processes.

For an educational institution, the main focus of its quality endeavor is arguably the teaching and learning process. While it may be true that the traditional teaching approach has mainly been teacher-centered with emphasis on transmission of information, many researchers have been advocating a teaching approach that is student-centered with emphasis on facilitation of learning (e.g. Harvey and Knight, 1996; Biggs, 2003; Ramsden, 2003). Such an approach promotes the enhancement and empowerment of the learners and places teaching and learning at the center of an institution's practice, relating them closely to the transformative perspective of educational quality. In the following subsections and Section 2.5, a review of the major research into students' experiences of the teaching and learning process is summarized, with particular interest in quantitative instruments for obtaining student feedback. The review attempts to highlight the major issues of concern in the published work, and pave the way for the present study to focus its research interest on students' learning patterns and students' perceptions of the learning context.

2.4.1 Students' Evaluations of Teaching Effectiveness

There is a rich body of research into students' evaluations of teaching effectiveness (SET), especially the use of *student feedback questionnaire* (SFQ) and the factors that may affect the evaluative results collected via such an instrument, which can be dated back to the pioneering work of H. H. Remmers in the 1920s (Wachtel, 1998:191). As a matter of fact, SET has become a common feature of the quality assurance systems of many educational institutions worldwide, aiming to fulfill multiple purposes such as improving teaching quality, supporting staff appraisal and responding to explicit requirement for quality monitoring (Kember *et al.*, 2002:412).

According to Richardson (2005a:388), the Students' Evaluations of Educational Quality (SEEQ), an instrument developed by Marsh (1987), has been most widely used in published work for the field of SET. The SEEQ comprises 35 statements that are intended to collect student feedback on nine aspects of effective teaching: *Learning/Value*, *Enthusiasm*, *Organization*, *Group Interaction*, *Individual Rapport*, B*readth of Coverage*, *Examinations/Grading*, *Assignments* and *Workload/Difficulty*. Through various researchers' work the validity of SET has been sufficiently well established, and there is empirical evidence indicating that the reliability of the SEEQ is high, its factor structure is consistent across different educational settings, and the correlation is high between the ratings produced by students taking different courses taught by the same teacher, and between students' evaluations of teachers and teachers' self-evaluations. In concluding his research, Marsh (1987) contends that "student ratings are clearly multidimensional, quite reliable, reasonably valid, relatively uncontaminated by many variables often seen as sources of potential bias, and are seen to be useful by students, faculty and administrators" (p.369). In his review of the field, Wachtel (1998) also concludes that "after nearly seven decades of research on the use of student evaluations of teaching effectiveness, it can safely be stated that the majority of researchers believe that student ratings are a valid, reliable, and worthwhile means of evaluating teaching" (p.192).

A key concern in the research into SET is the possibility of student ratings being biased by *extraneous factors* that are unrelated to teaching effectiveness. An excellent discussion on the study of *potential biases* is provided in Chapter 5 of Marsh (1987), which finds that "four background variables were most important and could account for nearly all the explained variance; more favorable ratings were correlated with higher prior subject interest, higher expected grades, higher levels of Workload/ Difficulty, and a higher percentage of students taking the course for General Interest Only" (p.307). Moreover, Marsh points out the methodological weaknesses common to most bias studies at that time (e.g., the use of correlation to argue for causation, and the lack of an explicit definition of bias against which to evaluate effects), and concludes that "for most of the relations, the effects tend to be small, the directions of the effects are sometimes inconsistent, and the attribution of a bias is unwarranted if bias is defined as an effect that is specific to students' evaluations and does not also influence other indicators of teaching effectiveness" (p.328).

Among the bias studies, it is worth noting that a moderate positive correlation between expected grades and student ratings is consistently found, and the following three hypotheses have been proposed as plausible interpretations of the phenomenon:

(a) *The leniency hypothesis*, which proposes that teachers who give higher-than-deserved grades will be rewarded with higher-than-deserved student ratings, and therefore the expected grade effect constitutes a bias;

(b) *The validity hypothesis*, which proposes that better expected grades reflect better student learning, and therefore the positive grade-rating correlation supports the validity of student ratings; and

(c) *The student characteristic hypothesis*, which proposes that preexisting student presage variables (e.g., prior subject interest) may affect student learning, student grades and teaching effectiveness, and therefore the expected grade effect is spurious.

While Marsh (1987:317-321) argues for clear support of the validity hypothesis and the student characteristic hypothesis, "numerous authors have argued in favor of the leniency hypothesis" and "at the present time the dispute over the possibility of leniency bias is not resolved" (Wachtel, 1998:202). It is noteworthy that although not necessarily constitute potential biases, the possible effects of various characteristics of the course, the teacher and the students on SET outcomes have not yet been sufficiently investigated, and there are still useful areas for further exploration in this research direction.

Despite the extensive research conducted in the field, there is still skepticism on the appropriateness and effectiveness of SET, which mainly draws on arguments concerning legal and educational policy and arguments concerning the validity of the methodologies adopted (Westermann *et al.*, 2002:44). There are fundamental doubts about students' capacity for evaluating teaching effectiveness. There are also reservations and concerns on the use of SET outcomes (especially on personnel decisions), and such sentiments are exacerbated by the fact that there are no clearly defined criteria of effective teaching and that, unlike the SEEQ, the SFQs currently being used by most educational institutions are developed in-house without formal validation. It has been argued that the routine use of SET may discourage innovation in pedagogy, as the questionnaire involved is typically more consistent with the transmission model of teaching, and implicitly militates against alternative models of teaching (Kolitch and Dean, 1999). It has also been argued that the routine collection of SET feedback does not automatically lead to improvement of teaching (Kember *et al.*, 2002); however, there is evidence that such feedback coupled with consultation is an effective means for improving teaching effectiveness (Marsh and Roche, 1993). Apart from SET, other means such as *peer review* and the potential use of *mystery students*[11] have been proposed as a means of evaluating the quality of teaching and learning and providing a vehicle for continuous improvement (Douglas and Douglas, 2006). However, it should be noted that SET is probably "the most thoroughly studied of all forms of personnel evaluation, ...and one of the best in terms of being supported by empirical research", and besides SET "there are few other indicators of teaching effectiveness whose use is systematically supported by research findings" (Marsh, 1987:360). Nevertheless, with an awareness of the limitations and concerns surrounding SET, it is advisable to take the pragmatic position as suggested by Rowley (2003) to employ SET as a means at the course level to listen to and engage in dialogue with students, and to understand and influence their motivation towards learning.

2.4.2 Students' Programme Experience and Total Experience

While SET represents a commonly adopted approach to educational quality and has perhaps the most voluminous research literature in the field, it can be argued that an appropriate focus of the quality endeavor should be students' experiences of their programmes or their total experience as learners, rather than their experiences of the

[11] As pointed out by Douglas and Douglas (2006), mystery customers have been used by organizations since the 1970s to measure and manage service quality via a form of participant observation. They are currently used in hospitals (mystery patients), in hotels (mystery guests), on trains and airlines (mystery passengers), in retail outlets (mystery shoppers) and in bars and restaurants (mystery drinkers and eaters) (p.10). It remains to be seen if the concept of mystery students can successfully be utilized to evaluate what is happening in the classrooms of higher education institutions (p.11).

teaching of individual courses.

A well-known instrument for assessing students' *programme experience* is the Course Experience Questionnaire (CEQ)[12], which was developed by Ramsden (1991a, 1991b) as an indicator of teaching quality, originally aiming to measure and compare the performance of academic organizational units. The CEQ has a substantial literature addressing its theoretical underpinnings and development history, as well as its reliability and validity in a variety of settings (Wilson *et al.*, 1997). As it has been selected for adaptation to form part of the research instrument in the present study, more details on these issues are discussed in Chapter 3. At this juncture, it is worth mentioning that since 1993, the Graduate Careers Council of Australia (GCCA) has included the CEQ as part of its annual Graduate Destination Survey, and the survey reports (e.g., GCCA, 2004) are available from the website of the Council: http://www.gradlink.edu.au. Additionally, the CEQ literature has also informed the development of the instrument for the annual National Student Survey (NSS) in the UK (Richardson *et al.*, 2007). The NSS has been administered to final-year students in England, Wales and Northern Ireland since 2005; the report by Surridge (2008) summarizes the survey results for the three years from 2005 to 2007, and can be downloaded from the Teaching Quality Information (TQI) website: http://www.tqi.ac.uk.

The CEQ has been implemented in different versions during its development. The most extensive version comprises 36 items for six Likert scales (i.e., *Good Teaching, Clear Goals and Standards, Appropriate Workload, Appropriate Assessment, Emphasis on Independence* and *Generic Skills*) and an overall satisfaction item that can be used as a validity check on these scales. It should be noted that in the early 1990s the CEQ

[12] The 'course' in the CEQ corresponds to 'programme' in the Hong Kong context.

approach was innovative in using an instrument to generate performance data (cf. Section 2.3.2), and a similar strategy was also adopted in a project of the former Council for National Academic Awards (CNAA) of the UK for developing a number of instruments to collect data for indicators of programme quality (Yorke, 1995, 1996). Arguing against the limited coverage of student experience of the CEQ, the CNAA project team designed its broad-brush instrument for students in a different way, and the final product comprised 30 independent items that aimed for *breadth of coverage* at the expense of *psychometric correctness* (Yorke, 1995:21). However, the author considers the CEQ approach more favorable as the credibility of a survey depends heavily on the validity and reliability of the instrument, which can better be demonstrated through multi-item scales.

As a performance indicator, the CEQ is somewhat limited by its time lag in surveying students' programme experience after their graduation. To address this shortfall, the University of Sydney in Australia developed a modified version of the CEQ, called the Student Course Experience Questionnaire (SCEQ), for use in surveys with currently enrolled students (Ginns *et al.*, 2007). Since 1999, the SCEQ has become an integral part of the University's goal of enhancing the student experience (Barrie *et al.*, 2005), providing academic staff and academic managers with a timelier indicator of teaching and learning quality which can be used for various purposes, such as internal performance-based funding and national or international benchmarking. The demonstrated theoretical and psychometric relationships between the CEQ and the SCEQ can also provide a link between external quality assurance measures and internal quality enhancement surveys (Barrie and Ginns, 2007).

Apart from programme experience, educational quality can also be assessed through the *total experience* approach that aims to capture the entire learning experience undergone by students during their years in universities or colleges. In this regard, there is a rich body of research in the US, based on the work of researchers such as A. W. Astin, C. R. Pace, E. T. Pascarella and P. T. Terenzini. A common theme of the research is that the time and energy which students devote to educationally purposeful activities are the best predictors of their learning and personal development (Kuh, 2001a:1). Grounding on this body of research various instruments for surveying the *institutional impact* on students have been developed, such as the Student Information Form and the College Student Survey of the University of California at Los Angela, and the College Student Experience Questionnaire (CSEQ) of Indiana University.

It is noteworthy that the research into institutional impact is also the theoretical root of the National Survey of Student Engagement (NSSE) in the US, whose development was aimed to promote a particular way of thinking and talking about *collegiate quality*, based on how students actually use the resources for learning that the institutions provide, instead of the league-table-like rankings of these institutions that appear in various magazines to emphasize institutions' resources and reputations (Kuh, 2001b). Since 2000, the NSSE has been administered to first-year and senior students at four-year colleges and universities. Through the NSSE, students are asked to report their engagement in relevant activities that represent good educational practice, such as the frequency of using the institution's human resources, curricular programs and other opportunities for learning and development, the amount of reading and writing conducted during the academic year, the number of hours per week devoted to schoolwork, extracurricular activities, employment and family matters, and the nature of their examinations and coursework (Kuh, 2001a:2). To facilitate the conversation about student engagement, learning and institutional improvement, key questions from the survey are grouped into five clusters or benchmarks of effective educational practices, namely *Level of Academic Challenge*, *Active and Collaborative Learning*, *Student-Faculty Interaction*, *Enriching Educational Experiences* and *Supportive Campus Environment* (Kuh, 2003). The report of the survey (e.g., NSSE, 2006) is produced annually, and can be downloaded from the NSSE website: http://www.iub.edu/~nsse. The NSSE has a variant called the Community College Survey of Student Engagement (CCSSE) that is developed for two-year colleges.

Besides assessing students' engagement, surveys adopting the total experience approach also assess students' *development or gains* from their post-secondary education by asking students to estimate their educational and personal growth, typically in the areas of general knowledge, intellectual skills, written and oral communication skills, personal, social and ethical development and vocational preparation. Inspired by the research in the US, Tam (2001b) adapted the CSEQ to derive the Lingnan Student Experiences Questionnaire (LSEQ) for the context of higher education in Hong Kong and used students' self-reported gains as a measure of *value-added* (Tam, 2004), corresponding to the transformative view for assessing educational quality and institutional performance (Tam, 2001a).

The concept of value-added has its origin in the field of economics, for which the notions of *input* and *output* are vital. Saunders (1999) summarizes the historical development of this concept in an educational context, where it is considered by many as useful for conducting *fair comparisons* among educational institutions or measuring *quality as transformation* in terms of student development. While the use of value-added measures in the school sector (e.g., Fitz-Gibbon, 1996; Tymms, 1999/ 2000) has achieved a certain degree of success, applying the concept in its original *input/output notion* to post-secondary education has been met with various problems (e.g., York, 1998:47; HEFCE, 2007:28), mainly due to the uncertainty of what counts as appropriate input and output in this sector. The attempt of Tam (2001b, 2004) to measure value-added by *student self-reports* represents an interesting approach to cope with these problems without the need for directly addressing the input/output issues.

However, it is worth noting that while "a considerable body of social science research documents that self-reported information is likely to be valid if certain conditions are met" (Kuh, 2001b:13), "a lot of caution must be used when making institutional comparisons based on student self-reports, especially if they require a substantial level of inference on the part of the respondent. Most evidence suggests that students are quite accurate in reporting low-inference, factual data ... But, making comparisons among institutions on less 'factual', higher-inference items, like the quality of teaching received, the nature of the institution's intellectual/academic environment, or self-reported growth in college, can be potentially misleading" (Pascarella, 2001:22). Moreover, although measuring student engagement in terms of devoted time and energy may be important for the quality process, students can in fact "be engaged in a range of effective practices and still not be learning with understanding," and they can also "be learning with understanding but not be able to apply what they are learning to practical matters or in different contexts" (Kuh, 2003:31). It is clear that to gain a better understanding of educational quality, the study of the nature of student learning is more advisable.

2.4.3 Student Satisfaction and Service Quality

In an era of massive expansion and growing consumerism in post-secondary education where there is keen competition for students among institutions, collecting and acting upon feedback on students' satisfaction with their experience has become an important aspect of the quality process (Leckey and Neill, 2001; Harvey, 2003). While in many student surveys satisfaction has typically been measured by a simple yes/no question or an overall question assessing its degree, there are also more rigorous approaches to measuring the construct of *student satisfaction* (e.g., Elliott and Shin, 2002) and the related construct of *service quality* (e.g., Rowley, 1997), which are based explicitly on consumer theory with students' *expectations* playing a key role. These constructs are related to the concept of *perceived quality* (as oppose to *objective quality*), which is a form of attitude resulting from a comparison of expectations with perceptions of performance. In the traditional view taken by Rowley (1996), service quality is a global judgment whereas consumer satisfaction is related to a specific transaction, and it is commonly believed that incidents of satisfaction over time leads to perceptions of good service quality. It is also important to note that "in the satisfaction literature, expectations are viewed as *predictions* made by consumers about what is likely to happen during an impending transaction or exchange. One the other hand, in the service quality literature expectations are viewed as desires or wants of customers or what they feel a service *should* rather than *would* offer" (p.239).

As pointed out in Richardson (2005a), in North America one widely used instrument for student satisfaction survey is the Noel-Levitz Student Satisfactory Inventory that measures students' satisfaction with their experience of higher education. "It contains either 76 items (for institutions offering two-year programmes) or 79 items (for institutions offering four-year programmes); in each case, respondents are asked to rate both the importance of their expectation about a particular aspect of higher education and their level of satisfaction. Overall scores are calculated that identify aspects of the students' experience where the institutions are failing to meet their expectations" (p.392). Noel-Levitz, Inc. produces annually the national student satisfaction and priorities reports, which can be downloaded from its website: http://www.noellevitz.com.

In the UK, the *student satisfaction approach* developed at the University of Central England (UCE) is noteworthy. According to Harvey (2003:8), a special feature of this methodology is that the areas of concern (i.e. the instrument items in each year of the survey) about which students are asked to rate their satisfaction and importance are not pre-specified, but are student-determined on the basis of feedback from focus-group sessions and telephone interviews, and comments provided on the previous years' instruments. The statistical data collected through the survey is mapped onto a two-dimensional *satisfaction and importance grid*, with one dimension ranging from 'very satisfactory' to 'very unsatisfactory', and another dimension ranging from 'very important' to 'not so important'. Aspects of the student experience that are of high importance but low satisfaction are priority areas for management awareness and appropriate responses. The UCE publishes its satisfaction report annually for public consumption (e.g., MacDonald *et al.*, 2007), which can be downloaded from the website of its Centre for Research into Quality (CRQ): http://www.uce.ac.uk/crq. The approach has also been adopted at a number of institutions in the UK and other countries or cities, including Hong Kong (Geall, 2000).

In the field of service quality, Parasuraman *et al.* (1985) develop the most widely applied model based on qualitative interviews with 14 executives in four service businesses and 12 customer focus groups. In the executive interviews, the following four kinds of *quality gap* were identified:

(a) The understanding gap: the difference between what consumers expect of a service and what management perceives consumers to expect;

(b) The design gap: the difference between what management perceives consumers to expect and the quality specifications set for service delivery;

(c) The delivery gap: the difference between the quality specifications set for service delivery and the actual quality of that service delivery; and

(d) The communication gap: the difference between the actual quality of service delivery and the quality of that service delivery as described in the firm's external communications.

However, it is argued that the most important gap is that between customers' expectation of service and their perception of the service actually delivered, as unambiguously identified in all focus group interviews. Service quality as perceived by a consumer depends on the size and direction of this gap, which in turn depends on the nature of the other four gaps (p.48).

Parasuraman *et al.* (1988, 1991, 1993) also develop the SERVQUAL, a general-purpose instrument for assessing service quality based on the above-proposed model. In its final format, the instrument consists of 22 pairs of Likert scales that are aimed to measure consumers' expectations and perceptions of service quality on the following five generic dimensions (p.23):

(a) Tangibles: Physical facilities, equipment, and appearance of personnel;

(b) Reliability: Ability to perform the promised service dependably and accurately;

(c) Responsiveness: Willingness to help customers and provide prompt service;

(d) Assurance: Knowledge and courtesy of employees and their abilities to inspire trust and confidence; and

(e) Empathy: Caring and individualized attention which the firm provides to its customers.

However, the application of the SERVQUAL in higher education has so far met with little apparent success. Buttle, as cited in Rowley (1996), has summarized the drawbacks of the SERVQUAL from both theoretical and practical perspectives. "A common theoretical complaint is that the service dimensions that are hypothesized do not regularly emerge from the factor analysis. On the operational side, the need to ask the same question twice is a common cause of criticism" (p.251). Clewes (2003) also notes that debatable issues in the SERVQUAL literature are still many and varied, e.g., those raised in Swan and Bowers (1998) and Robinson (1999). "They include the appropriate definition of service quality, the 'correct' model for service-quality measurement, unresolved issues related to expectations, the format of the measurement instrument and the dimensionality of service quality in different contexts" (Clewes, 2003:73).

Although attracting and keeping students satisfied or even delighted (e.g., Popli, 2005) may become important nowadays, and although the student satisfaction approach may have the potential for "building a bridge between more traditional and academic views on how to improve higher education, and more market perspectives" (Wiers-Jessen *et al.*, 2002:193), appropriate caution should be exercised in applying such an approach in the quality endeavor, as it tends to treat students as customers who are passively receiving service, instead of partners who are actively participating in the learning process. Challenging the concept of satisfaction in measuring quality, Bramming (2007) argues that from the goal of enhancing transformative learning in higher education, considerations of quality should be based on the concept of *strong learning*, which "approaches learning as a social and processual phenomenon, where learning is made possible through a specific assemblage of social and processual conditions that force learning to be transformative through a continuous production of crisis" (p.46). From a strong learning perspective, students can have an emotional way of learning (e.g., being angry, frightened, unsatisfied, etc.). "These negative emotions which are not normally seen as signs of learning in quality efforts may turn out to be the most important signs of learning" (p.51). In Vermunt and Verloop (1999), *constructive frictions* between teaching and learning "may be necessary to make students willing to change and to stimulate them to develop skill in the use of learning and thinking activities they are not inclined to use on their own" (p.270). It is obvious that these issues cannot be appropriately addressed from the student satisfaction or service quality perspective; to better understand the contestable nature of educational quality, the complex phenomena relating to student learning should be investigated.

2.5 Student Learning

A good starting point for studying student learning is Richardson's (2000) book that discusses the historical and conceptual backgrounds of the field and introduces the commonly used instruments for research at that time. The papers in the special issue of *Educational Psychology Review* on student learning in December 2004 (e.g., Entwistle and McCune, 2004; Lonka *et al.*, 2004; Pintrich, 2004; Richardson, 2004; Vermunt and Vermetten, 2004) and the reviews of Salomon (1995) and Pintrich (2000a) as the editor of *Educational Psychologist* also form a valuable frame of reference for the present study.

Generally speaking, the current research into student learning can broadly be classified into two approaches: student approaches to learning (SAL) and self-regulated learning (SRL). The mostly cited seminal work for SAL is that of Marton and Säljö (1976a, 1976b) in which students were asked to read selected passages and questioned about their understanding of them. Two qualitatively different levels of processing were identified in these experiments: in the case of *surface-level processing* students directed their attention to the text of the learning material (i.e. the sign), and in the case of *deep-level processing* students directed their attention to the intentional content of the learning material (i.e. what is signified). Subsequent work has shown that the levels of processing identified in the experiments of passage understanding have their counterparts in students' approaches to learning in their normal studies (Marton and Säljö, 1984), where students may adopt a *deep approach* with the intention to understand or a *surface approach* with the intention to rote learn, depending on the *institutional context* and *personal context* (Gibbs *et al.*, 1984). The institutional context is largely related to students' perceptions of the academic environment, such as the quality of the teaching, the nature of the assessment and the demand of the specific learning task. In this regard, the surface approach is found to be relating to students' perceptions of inappropriate workload and inappropriate assessment. The personal context includes constructs such as students' conceptions of learning, their conceptions of themselves as learners and their educational orientations. In this regard, the deep approach is found to be relating to students' conceptions of learning that emphasize understanding, or students' educational orientations that emphasize intellectual interests. Ramsden (1979) claims to have identified a third approach to learning/studying, i.e. the *strategic approach* through which students aim to obtain the highest possible grades and seek cues to spend their effort to the greatest effect. However, subsequent research has generally failed to consistently confirm the separate existence of this approach (e.g., Kember and Leung, 1998; Richardson, 2000:27).

The methodological origin of SAL is *phenomenography*, which is "a research method for mapping the qualitatively different ways in which people experience, conceptualize, perceive, and understand various aspects of, and phenomena in, the world around them" (Marton cited in Richardson, 2000:34). This methodology subjects the transcripts of students' oral accounts collected via comprehensive interviews to an iterative and interactive analytical process in order to identify the fundamental categories or themes of the phenomena being investigated (cf. Svensson, 1997; Åkerlind, 2005). Many researchers consider it as similar to *grounded theory* (e.g., Richardson, 2000:35; Lonka *et al.*, 2004:302); however some researchers have raised concerns on its privileging of students' folk theories of learning (e.g., Pintrich, 2004:402), and there has been contestation on the notion of deep/surface approaches derived from it (e.g., Ekeblad, 1997; Entwistle, 1997; Webb, 1997a, 1997b) and doubt on the applicability of the notion within contemporary higher education (e.g., Haggis, 2003). Nevertheless, apart from the *deep-surface distinction*, phenomenography has also contributed to the development of other key concepts in the field of SAL. For example, using the methodology researchers have identified a limited number of conceptions of learning and a limited number of educational orientations from the externalization of students' experiences, more details of which can be found in Chapters 3 and 4 of Richardson (2000). It is also noteworthy that the simplistic deep-surface distinction is still generally considered as a useful concept on which practical applications are based (e.g., Biggs *et al.*, 2001), although there are suggestions that approaches to learning should better be described as a spectrum rather than two dichotomous categories (e.g., Kember *et al.*, 1999:334).

Instruments in the form of inventories or questionnaires have also been developed for quantitative research in the field of SAL; popular examples include the Study Process Questionnaire (SPQ) and the Approaches to Studying Inventory (ASI) whose details can be found in Chapters 5 to 7 of Richardson (2000). Although the development of most quantitative instruments has typically been based on key concepts identified by phenomenographic studies via the approach of *two-step design* (Lonka *et al.*, 2004:302), there is still much room for the future improvement of these instruments. In a recent review Richardson (2004) finds that students' scores on these instruments "show reasonable stability over time, moderate convergent validity with their scores on other questionnaires, and reasonable levels of both discriminating power and criterion-related validity." However, "the internal consistency of their constituent scales is variable, and the construct validity of these instruments...is disappointing." "The content validity of these instruments is open to question because of changes both in higher education and in society at large since they were originally devised. The appropriateness of the original wording of these questionnaires when used with students from other social, cultural, or ethnic groups is highly doubtful" (p.355). These important concerns have informed the investigation of the present study.

In contrast with the SAL approach that is more often adopted in Europe and Australia and is derived in a *bottom-up* manner from students' experiences, the information processing (IP) approach is more often adopted in North America and is derived in a *top-down* manner from psychological constructs and theories in cognitive and educational psychology for application in student learning. As the IP approach is considered too limited and not reflective of current theory and research, it has been replaced by the self-regulated learning (SRL) approach that takes a much more inclusive perspective on student learning, encompassing not only cognitive, but also motivational, affective and social contextual factors (Pintrich, 2004:386). Based on the SRL perspective, Pintrich (2000b, 2004) proposes a conceptual framework which offers a broad outline of the different types of self-regulatory strategies that college students may use to control their cognition, motivation, affect and behavior as well as the learning context, in different phases ranging from forethought, monitoring, control and reflection (see also Zimmerman, 2000). The framework is meant to provide a blueprint for the future development of assessment instruments to measure these different strategies; but the Motivated Strategies for Learning Questionnaire (MSLQ), the currently available instrument derived from the framework, only measures a small portion of them (Pintrich, 2004:400).

As argued by Pintrich (2004), the SAL and SRL perspectives share some common assumptions, most notable the *active constructive assumption* which views the learners as active participants of the learning process, and the assumption of *the central role of self-regulatory activities* as the mediators between personal and contextual characteristics and actual achievement or performance. However, there are also differences between the two perspectives that may render SAL and SRL models incommensurable, one of them is the choice of *grain size*. In general, SAL models focus on a much larger grain size than SRL models, opting for much larger units of analysis such as general approaches to studying or learning, rather than specific phases and the strategies that may be implicated in different phases as in SRL models. As a result, SAL models are more amenable to the use of self-report instruments such as inventories or questionnaires that are less able to capture the relevant processes at a fine grain level in terms of the actual cognitive events or tactics used by students as they study and learn (Pintrich, 2004:391). However, from the SRL perspective questions can be raised on the validity and utility of measuring student motivation (Volet, 2001a, 2001b) or self-regulation (Boekaerts, 1995, 1997; Martin, 2004) at a coarse grain level above the individual courses. Nevertheless, by adopting a more global and holistic approach to describing student motivation (e.g., Kember *et al.*, 2008) or other student learning aspects, SAL models have "the advantage of being relatively simple and easy to understand, especially for faculty who are not researchers on student motivation and learning. This is particular helpful in faculty development efforts to improve college and university teaching" (Pintrich, 2004:403).

As teachers constitute an important part of the learning context for students, and students in turn constitute an important part of the teaching environment for the teachers, the interplay between teaching and learning in higher education is a research area with theoretical significance and practical relevance (Biggs, 2003; Prosser and Trigwell, 1999/2000; Ramsden, 2003; Richardson, 2005b). From a relational perspective, Trigwell and Prosser (2004) develop the Approaches to Teaching Inventory (ATI) as an instrument for research into university teaching, and use it to show that teacher-focused approaches to teaching are more associated with students' surface approach to learning, and student-focused approaches to teaching are more associated with students' deep approach to learning. However, the critique of Meyer and Eley (2006) on the development and applicability of the ATI is noteworthy, as it addresses the vital issues of which researchers should be aware when adopting the two-step approach to developing quantitative instruments from qualitative studies.

Unlike most previous research into student learning which focuses on the relationships among a limited range of learning components (mainly the cognitive and motivational aspects), the series of studies reviewed in Vermunt and Vermetten (2004) increase the integration of components to encompass the cognitive, regulative, metacognitive and motivational aspects, and are considered by some researchers as building a bridge between the SAL and SRL traditions (Lonka *et al.*, 2004:305). The research instrument used in these studies is the Inventory of Learning Styles (ILS), which has a substantial literature addressing its theoretical underpinnings and development history, as well as its reliability and validity in a variety of settings (e.g., Vermunt, 1998; Ajisuksmo and Vermunt, 1999; Boyle *et al.*, 2003). As the ILS has been selected for adaptation to form part of the research instrument in the present study, further discussion on these issues is presented in Chapter 3.

To improve our understanding of the complexity of student learning the adoption of a more integrative approach, like the research based on the ILS to investigate the multiplicative interactions of the relevant learning components in real-life settings, is an important direction for future research. Another important direction is the extension of the research interest from *the individual learner* to *the learner in social context* (Salomon, 1995; Pintrich, 2000a). Viewing the social context from a finer grained perspective, the collaboration and interactions among students can form an influential latent dimension in their learning (Tang, 1996), especially in the Hong Kong context that is affected by the tradition of Chinese collectivism (Watkins and Biggs, 1996). In their study of the out-of-class student groups, Yan and Kember (2004) find two typical group learning approaches that correspond to the deep and surface approaches in individuals' learning. Specifically, the *engager approach* is adopted by groups that collaborate to better their understanding of an issue or concept (and is considered as the group equivalent of the deep approach), and the *avoider approach* is adopted by groups that aim to minimize the amount of work each group member has to perform on study tasks (and is considered as the group equivalent of the surface approach).

Viewing the social context from a more macroscopic perspective, the possibility of *cultural influence* on student learning should not be ignored (e.g., Richardson, 1994a). A well-known example of such an influence is the *Paradox of the Chinese Learner* that has puzzled many western researchers with the conflict between the seemingly rote-learning strategies being adopted and the high performance being achieved by some Chinese students. The apparent 'paradox' can in fact be explained by the fact that in the culture of China and other Asian countries affected by the Confucian heritage, memorization can occur in conjunction with the intention to understand; whereas, in the culture of most western countries memorization and rote learning are generally equated, and it is commonly believed that they do not lead to understanding (Marton *et al.*, 1996; Kember, 2000). Appropriate caution should therefore be exercised when interpreting results or adapting instruments for research into student learning from other cultures.

Finally, the investigation into the phenomenon of *dissonance in student learning* is noteworthy. The phenomenon has its origin in the study of Meyer (1991) which introduces the concept of *study orchestration* to explicitly acknowledge the typical consonant relationships among higher education students' learning components (e.g., learning conceptions, orientations and strategies), as manifested in students' contextualised learning behaviors at both the individual and group levels. However, there is empirical evidence that certain student subgroups exhibit dissonant forms of study orchestration where the expected theoretically coherent linkages between some or all of the more common sources of explanatory variation fail to appear in a readily recognizable and interpretable form (Meyer, 2000:5). More details on the studies of the dissonance phenomenon can be found in the special issue of the *European Journal of Psychology of Education* (Volume 15) in 2000, and the special issue of the *Studies in Higher Education* (Volume 28, No. 1) in 2003.

Students' exhibition of the dissonance phenomenon has been associated with low academic achievement or academic failure, and therefore the investigation of its nature to inform suitable teaching and learning practices and/or intervention programmes can be vital to the quality endeavor. However, it is worth mentioning that sometimes the apparent 'dissonance' may be the manifestation of cultural differences in the relationships among the learning components which should not be interpreted as deviation from normality (Vermunt and Minnaert, 2003), or it may be the manifestation of a developmental phenomenon featuring the progressive integration of learning components as the learner become more experienced, and therefore the 'period of dissonance' that is possibly induced by the development is in fact normal, adaptive and necessary (Vermunt and Verloop, 2000).

2.6 Concluding Remark

In this chapter, the relevant literature concerning educational quality has been reviewed, with an attempt to establish a coherent reference framework that sets the background and guides the investigative direction of the present study. While different conceptions of educational quality have been proposed and various approaches to addressing the quality issues have been practiced, it can be argued that to cope with the education reform and the expansion of post-secondary education in Hong Kong, the conception of *quality as transformation* should assume a more central role, and more attention should be paid to *the student experience* in general, and *student learning* in particular. A main theme of the present study is therefore the selection and adaptation of suitable quantitative instruments for investigating into student learning to provide empirical evidence that can inform the quality endeavor. The approach adopted in the present study is through the adaptation of the CEQ and the ILS. In view of the possible cultural influences, it is important for the adapted instruments to be validated for their applicability in the new response context before the exploration of possible relationships among the relevant learning components is conducted. The adaptation of the instruments and the validation studies are reported in Chapter 3 and Chapter 4 respectively.

3.1 General Design of the Investigation

3.1.1 Reference Framework

As mentioned in Chapter 2, there is a rich body of research into student learning, and the complexity of the phenomena related to it renders the need for a practical investigative project to address only a limited set of constructs as the explanatory sources of commonality and variation among students (e.g., Meyer, 1999; Vermetten *et al.*, 1999a). In this regard, the selection of an appropriate reference framework to guide the investigation is important. Examples of reference frameworks that have been proposed in some previous research include Ramsden's model of student learning in context (as specified in Ramsden (2003)), Biggs' 3P model[13] of teaching and learning (as specified in Biggs (2003)) and the constitutionalist model of student learning as proposed by Prosser and Trigwell (1999/2000). These frameworks have provided useful guidance to many reported studies in the so-called first generation of conceptualizations of student learning, which focused on the interrelationships among students' perceptions of the learning context, approaches to learning and learning outcomes.

In determining the research direction of the present study, the author is in agreement with the approach suggested by Vermunt and Vermetten (2004) to increase the integration of the existing constructs of student learning, with a focus on the cognitive, regulative, metacognitive and motivational components and their interrelationships, so as to contribute to the development of the second generation of conceptualizations of

[13] 3P refers to 'Presage', 'Process' and 'Product'.

student learning (p.361). On the other hand, the author also accepts that there are other aspects that are influential in student learning, with students' perceptions of the learning context being an important one that should not be left out in a research endeavor.

In the light of the above considerations, the reference framework for the present research is based on the nested model proposed by Meyer (2004a) for identifying and locating the generic sources of variation in student learning, with appropriate selection and operationalization of the constructs which are of interest in this investigative endeavor. The final stage of the nested model is shown in Figure 3.1. Meyer suggests the use of the term 'observable' in preference to the term 'variable' for describing the relevant aspects of the conceptions that are encapsulated in the model, in recognition of the subjective and essentially self-referencing nature with which students externalize their learning experiences (p.1). The suggested terminology is adopted in this document.

As a general-purpose model, the building blocks of the reference framework are all the relevant constructs that have been identified in previous empirical studies as being influential on student learning. Each construct represents a family of observables signifying the possible sources of variation among students in their engagement of learning. Interrelationships among the constructs are denoted by single-headed arrows and double-headed arrows, signifying respectively the one-way influences and two-way interactions that are the most likely resultants of the complex relationships between the sources of variation concerned (p.6).

As suggested by Meyer, previously proposed models such as Ramsden's learning-in-context model and Bigg's 3P model can be viewed as *reduced models* extracted from the nested model (p.7). To a large extent, the reference framework of the present research can also be viewed as such a reduced model, focusing on the constructs of 'motivation', 'intention', 'context/content', 'capabilities', 'conceptions-prior knowledge', 'learning process' and 'outcome(s)', with the effect of 'culture' being briefly addressed when deemed appropriate in the comparison of findings between the present study and the other previous research. These constructs are highlighted in bold type in Figure 3.1 for easy reference; they and their interrelationships were subject to empirical investigation in the present study.

The selected constructs can also be classified into two domains: the personological domain and the contextual domain, as mentioned in Section 1.5. The operationalization of the constructs in these two domains is discussed in Section 3.2 below, when the development of the research instrument is explained.

3.1.2 Basic Approach

Basically, quantitative data analysis (cf. Chapter 14 of Babbie (2004)) was adopted as the main approach to investigation in the present study. As mentioned in Chapter 1, an inspiration of the present research is to respond to the concern of the poor design and lack of standardization of many instruments that are being employed by higher education institutions in the quality assurance (QA) of their teaching and learning processes (Rowley, 1995; Leckey and Neill, 2001:25), and to address the theoretical and practical issues of using quantitative instruments as an important source of student feedback (Richardson, 2005a).

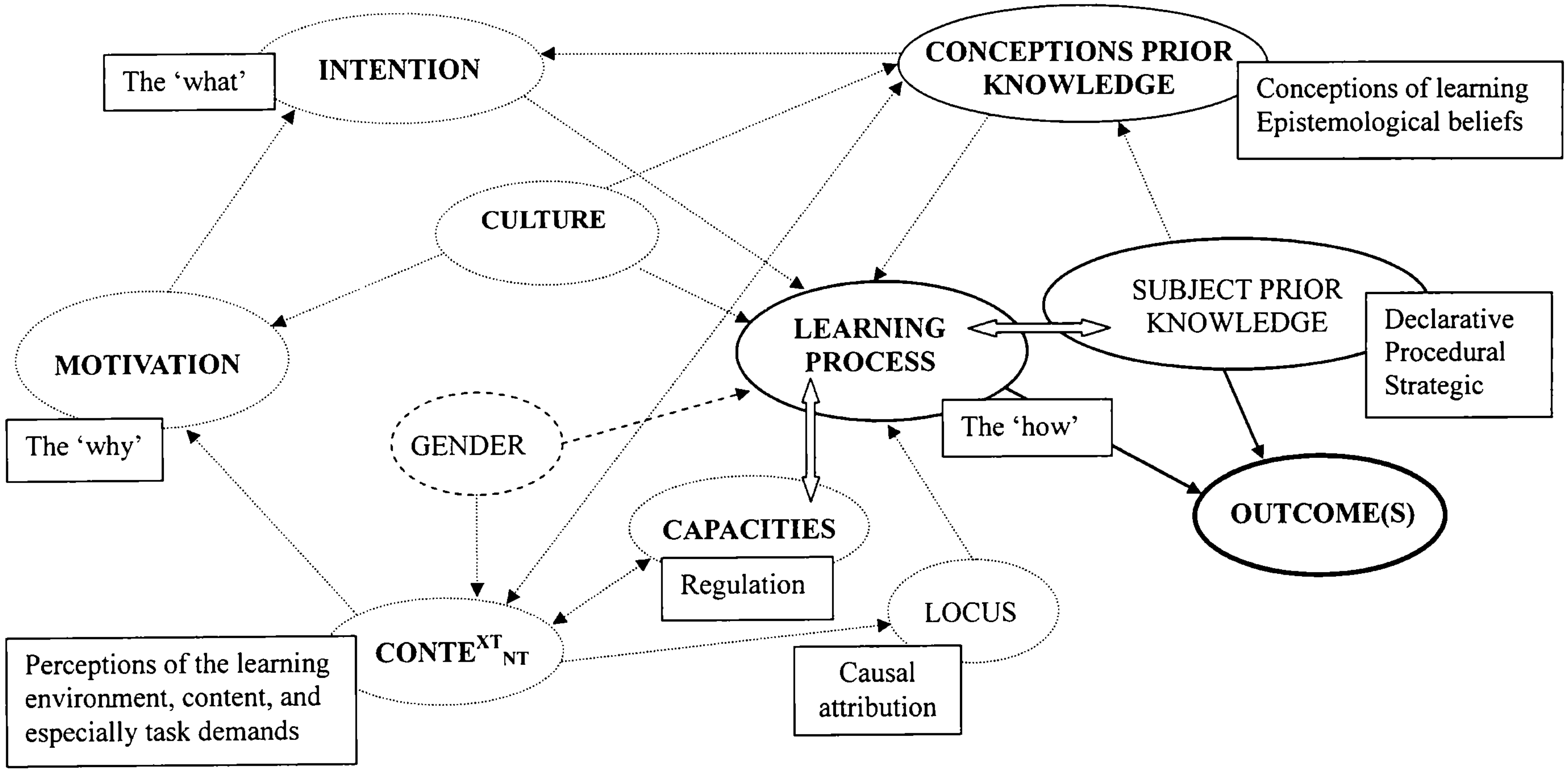

Figure 3.1 Reference Framework for the Present Research
Adapted from the Nested Model of Student Learning in Meyer (2004a)

In the comprehensive design of a research instrument, some researchers have adopted a two-step approach by firstly starting with interviews and other qualitative analyses to collect responses from students and teachers on their experiences, perceptions and conceptualizations of the phenomena under investigation (e.g., adopting the *phenomenographic* methodology as pioneered by Marton and Säljö (1976a, 1976b) in their research into student learning). In the second step, the descriptive categories derived from the qualitative analyses are transformed into instrument items, which are then psychometrically refined to develop a structured research instrument that will yield data for quantitative analyses (e.g., Vermunt, 1996, 1998; Meyer, 2004b; Trigwell and Prosser, 2004). Although there are concerns from some researchers on the danger of such a two-step approach being atheoretical and folk-psychological (e.g., Pintrich, 2004), other researchers consider it as a desirable way to combine *qualitative* and *quantitative* approaches to research (e.g., Lonka *et al.*, 2004:304).

It is worth mentioning that most reported studies that have adopted the two-step approach have involved a lengthy process, typically lasting several years, in the testing and fine-tuning of the instrument items. Adopting such an approach in the purest sense is considered unsuitable for an educational research endeavor like the present study, in view of the constraints on the time that can be spent and the other supportive resources that can be deployed. The author has therefore decided not to base the development of the research instrument on original qualitative analyses conducted in the local context of post-secondary education in Hong Kong, but to exploit the results of published work in adapting appropriate instruments that have been used in other contexts. Apart from the need to closely match the research direction of the present study, the selection of instruments for adaptation was also based on the following two criteria:

- The instrument selected for adaptation must have gone through a development process following or resembling the two-step approach, so that the relevance of the data collected through it is strongly based on qualitative research (at least in its original developmental context);

- The instrument must have also gone through rigorous analyses to ascertain its psychometric properties (e.g., appropriate measures on reliability and validity) for application in its specific context.

Nevertheless, in applying the adapted instruments as a composite research instrument for the present study, the psychometric properties of these instruments should be re-established in the local context (Richardson, 2004:353), and it is also expected that some constructs being encapsulated in their scales may be to a certain extent context-dependent, resulting in a need for these scales to be revised for effective analyses of the data collected from the new context.

3.2 Instrumentation

With more than thirty years of research, there is now a plethora of instruments being employed to obtain feedback from students on their learning, especially their learning patterns and their perceptions of the learning contexts. After a survey on some of the published work on these instruments (e.g., Ramsden, 1991a, 1991b; Yorke, 1995, 1996; Richardson, 2000, 2005a; Entwistle and McCune, 2004; Lonka *et al.*, 2004; Vermunt and Vermetten, 2004), the Course Experience Questionnaire (CEQ) and the Inventory of Learning Styles (ILS) were selected for adaptation to form the composite research instrument of the present study. To the knowledge of the author, the CEQ and the ILS have never been used in the context of post-secondary education in Hong Kong to investigate Chinese students' perceptions and learning patterns. The present study therefore presents a good opportunity for cross-validating the two instruments in this new response context, in addition to seeking answers to the research questions.

3.2.1 Course Experience Questionnaire (CEQ)

The CEQ was designed as a performance indicator of teaching quality in higher education at the level of the whole programme of study (Ramsden, 1991a, 1991b). It represents the development of work originally carried out at Lancaster University in the UK in the 1980s, and is based on Ramsden's learning-in-context model within which students' perceptions of the learning context (e.g., curriculum, teaching and assessment) are regarded as key determinants of their approaches to learning and their learning outcomes (Ramsden, 2003). Since 1993, the CEQ has become an instrument for measuring the perceived teaching quality of degree programmes in national annual surveys of all graduates in the Australian higher education system (e.g., GCCA, 2004). Additionally, the development of an instrument for the UK National Student Survey was also informed by the CEQ literature (Richardson *et al.*, 2007). It is increasingly being employed as a measure of teaching quality in universities in the UK (Wilson *et al.*, 1997), and has been tested in other general and specific contexts (e.g., Byrne and Flood, 2003; Kreber, 2003).

The construction process, and the psychometric properties, of the CEQ are reported in Ramsden (1991a). In its original design, the CEQ comprised 30 items (hereafter the CEQ30) which defined the following five scales: *Good Teaching* (8 items), *Clear Goals and Standards* (5 items), *Appropriate Workload* (5 items), *Appropriate Assessment* (6 items) and *Emphasis on Independence* (6 items).

The most widely used version of the CEQ is the 23-item short form (hereafter the CEQ23), which was developed in consultation with the Department of Employment, Education and Training (DEET) of Australia as a basis (from 1993 onwards) for a national survey of graduates (Wilson *et al.*, 1997:35). In that version, the strongest loading items of the CEQ30 were retained, with the *Good Teaching*, *Clear Goals and Standards*, *Appropriate Workload* and *Appropriate Assessment* scales being defined by 6, 4, 4 and 3 items respectively. The *Emphasis on Independence* scale was dropped due to its comparatively weaker scale structure, but a new scale *Generic Skills* (6 items) was added.

There is also a 36-item version of the CEQ (hereafter the CEQ36) that comprises the CEQ30 and the six items of the *Generic Skills* scale. Its employment as an investigative instrument has been reported in some research (e.g., Lizzio *et al.*, 2002; Richardson, 2005c). The details of the CEQ as adapted from Wilson *et al.* (1997:53) with highlights on the differences between its three versions can be found in Appendix I. The scales of the CEQ36, each illustrated with one defining item, are shown in Table 3.1 below.

In the CEQ, items are scored on a five-point Likert scale, enabling the respondents to indicate their agreement or disagreement with scores ranging from (1) 'I completely disagree' to (5) 'I completely agree'. The CEQ is technically not a questionnaire (as it does not ask questions of students) but it is nevertheless referred to as such. There is an additional item (i.e. Item 37) to record respondents' overall satisfaction with the quality of their respective programmes, and this single response is taken as providing a simple estimate of the concurrent criterion-related validity of the questionnaire. Some CEQ items are expressed in the negated sense, and are reversed scored.

Table 3.1 Scales of the CEQ36 and their defining items	
Scale (Number of Items)	Defining Item
1. Good Teaching (8)	Teaching staff here normally give helpful feedback on how you are going.
2. Clear Goals and Standards (5)	You usually have a clear idea of where you're going and what's expected of you in this course.
3. Appropriate Workload (5)	The sheer volume of work to be got through in this course means you can't comprehend it all thoroughly. (Negated)
4. Appropriate Assessment (6)	Staff here seem more interested in testing what we have memorized than what we have understood. (Negated)
5. Emphasis on Independence (6)	Students here are given a lot of choice in the work they have to do.
6. Generic Skills (6)	As a result of doing this course, I feel more confident about tackling unfamiliar problems.

An extensive survey of the development of the CEQ can be found in Richardson (2005a: 393-401). It is noteworthy that, while the CEQ is largely perceived as a valid and reliable instrument in most published response contexts, concerns have been expressed on various aspects of its design, such as the robustness of some of its scales (Richardson, 1994b), the appropriateness of its question format (Eley, 2001) and the limitation in its coverage of student experience (York, 1995). Nevertheless, the author was of the view that the CEQ is a tested and economic means to operationalize most of the constructs in the contextual-domain part of the reference framework for the present research, as mentioned in Section 3.1.1 above. Among the three versions of the CEQ, the CEQ36 was selected for adaptation in the development of a research instrument for the present study, aiming at a more extensive coverage of the constructs involved.

3.2.2 Inventory of Learning Styles (ILS)

The design of the ILS is based on an integrative theory and conceptualization of student learning which encompasses students' processing strategies, regulation strategies, learning orientations and conceptions of learning, with an aim to facilitate the investigation of interrelationships among these four components. The ILS has its origins in phenomenographic analyses of interviews conducted by Vermunt with students from both an open distance university and a regular university in the Netherlands. The intention was to investigate their ways of learning, and their ideas about learning and teaching, as well as their motives, concerns and personal goals in the pursuit of their studies (Vermunt, 1996). On the basis of the results from this phenomenographic study, the ILS was developed as an instrument for a research project focusing on students' regulation of their learning processes in higher education. The construction process and the psychometric properties of the ILS are reported in Vermunt (1998). During its development the ILS has been tested and fine-tuned several times, reducing the number of items that comprise it from 241 to 144, and finally to 120 and 100.

There are two final versions of the ILS; one comprises 120 items (hereafter the ILS120) and the other comprises 100 items (hereafter the ILS100). Both the ILS120 and the ILS100 assess five processing strategies, five regulation strategies, five learning orientations and five conceptions of learning. The details of the ILS as provided by Vermunt with highlights on the differences between the two versions can be found in Appendix II. It should be noted that the ILS100 is a subset of the ILS120, but it adopts a more regular design with each of the four learning components being defined by 25 items. The major difference between the ILS120 and the ILS100 is on the 'conceptions of learning' component, which is defined by 40 items in the ILS120, but by 25 items in the ILS100. The difference between the two versions in the other components is negligible. The scales of the ILS100 and brief descriptions of their content are shown in Table 3.2 below.

In the description of the ILS as given in Vermunt and Vermetten (2004), *processing strategies* refer to the thinking activities that students use to process the learning content. They lead directly to learning outcomes in terms of knowledge, understanding, skill, etc. In the research of Vermunt, three main processing strategies can be discerned: (a) a deep processing strategy which combines the learning activities *Relating and Structuring* and *Critical Processing*; (b) a stepwise processing strategy which consists of the learning activities *Memorizing and Rehearsing* and *Analyzing*; and (c) a *Concrete Processing* strategy with 'concretizing' and 'applying' as its major learning activities.

Regulation strategies refer to students' activities for regulating and controlling the processing strategies and therefore indirectly lead to learning outcomes. In the research of Vermunt, it was found that the main distinguishing feature of regulation is internal versus external control, with three main strategies or experiences being consistently observed: (a) a *Self-regulation* strategy in which students perform most regulative activities for their learning; (b) an *External Regulation* strategy in which students let their learning activities be regulated by teachers, textbooks and other external means; and (c) *Lack of Regulation* in which students face difficulties resulting from both their inability in self-regulation and their experience of insufficient external regulation.

Table 3.2 Scales of the ILS100 and their content

Domain: Sub-domain Scale (Number of Items)	Description of Content
I. Processing Strategies:	
1. Deep Processing	
1a. Relating and Structuring (6)	Relating elements of the subject matter to each other and to prior knowledge, structure these elements into a whole.
1b. Critical Processing (4)	Forming one's own view on the subjects that are dealt with, drawing one's own conclusions, and being critical of the conclusions drawn by textbook authors and teachers.
2. Stepwise Processing	
2a. Memorizing and Rehearsing (5)	Learning facts, definitions, lists of characteristics and the like by heart by rehearsing them.
2b. Analyzing (5)	Going through the subject matter in a stepwise fashion and studying the separate elements thoroughly, in detail and one by one.
3. Concrete Processing (5)	Concretizing and applying subject matter by connecting it to one's own experiences and by using in practice what one learns in a course.
II. Regulation Strategies:	
4. Self-regulation	
4a. Self-regulation of Learning Processes and Results (6)	Regulating one's own learning processes through regulation activities like planning learning activities, monitoring process, diagnosing problems, testing one's outcomes, adjusting and reflecting.
4b. Self-regulation of Learning Content (4)	Consulting literature and sources outside the syllabus.
5. External Regulation	
5a. External Regulation of Learning Processes (5)	Letting one's own learning processes be regulated by external sources, such as introductions, learning objectives, directions, questions or assignments of teachers or textbook authors.
5b. External Regulation of Learning Results (5)	Testing one's learning outcomes by external means, such as tests, assignments and questions provided.
6. Lack of Regulation (5)	Having difficulties with the regulation of one's own learning processes.
III. Conceptions of Learning:	
7. Construction of Knowledge (5)	Learn ing viewed as constructing one's own knowledge and insights. Most learning activities are seen as tasks of students.
8. Intake of Knowledge (5)	Learning viewed as taking in knowledge provided by education through memorizing and reproducing, other learning activities are tasks of teachers.

9. Use of Knowledge (5)	Learning viewed as acquiring knowledge that can be used by means of concretizing and applying. These activities are seen as tasks of both students and teachers.
10. Stimulating Education (5)	Learning activities are viewed as tasks of students, but teachers and textbook authors should continuously stimulate students to use these activities.
11. Cooperative Learning (5)	Attaching a lot of value to learning in cooperation with fellow students and sharing the tasks of learning with them.
IV. Learning Orientations:	
12. Personally Interested (5)	Studying out of interest in the course subjects and to develop oneself as a person.
13. Certificate Oriented (5)	Striving for high study achievements, studying to pass exams and to obtain certificates, credit points and a degree.
14. Self-test Oriented (5)	Studying to test one's own capabilities and to prove to oneself and others that one is able to cope with the demand of higher education.
15. Vocation Oriented (5)	Studying to acquire professional skill and to obtain a(nother) job.
16. Ambivalent (5)	A doubtful, uncertain attitude toward the studies, one's own capabilities, the chosen subject area, the type of education, etc.

Learning orientations refer to the whole domain of students' personal goals, intentions, motives, expectations, attitudes, concerns and doubts with regard to their studies. Instead of developing theories on each and every aspects of this whole domain, Vermunt identified major sources of variation among students in this domain and incorporated them into the ILS as five scales, namely *Personally Interested*, *Certificate Oriented*, *Self-test Oriented*, *Vocational Oriented* and *Ambivalent*.

Conceptions of learning or *mental models of learning* refer to a coherent system of knowledge and beliefs about learning and related phenomena, such as the nature of knowledge and the roles that should be assumed by teachers, classmates and the student themselves in students' learning. In the ILS, five scales are employed to capture the variation among students in this regard, namely *Construction of Knowledge*, *Intake of*

Knowledge, *Use of Knowledge*, *Stimulating Education* and *Cooperative Learning*.

A key feature to be noted in the learning theory of Vermunt is his model of regulation of constructive learning processes, as depicted in Figure 3.2. In the model, the regulation strategies assume a central and vital position in the interrelationships among the learning components. Vermunt hypothesized that in higher education, "the way in which students process the subject matter is most directly determined by the regulation strategies they employ. Mental learning models and learning orientations also influence the processing strategies that students use, but their influence is supposed to be mostly indirect, via regulation strategies. The way in which students regulate their learning processes is, to an important extent, determined by their mental models of learning and their learning orientations" (Vermunt, 1998: 153). It should be interesting to see if the model applies also to the post-secondary education of Hong Kong, in the new response context of the present study.

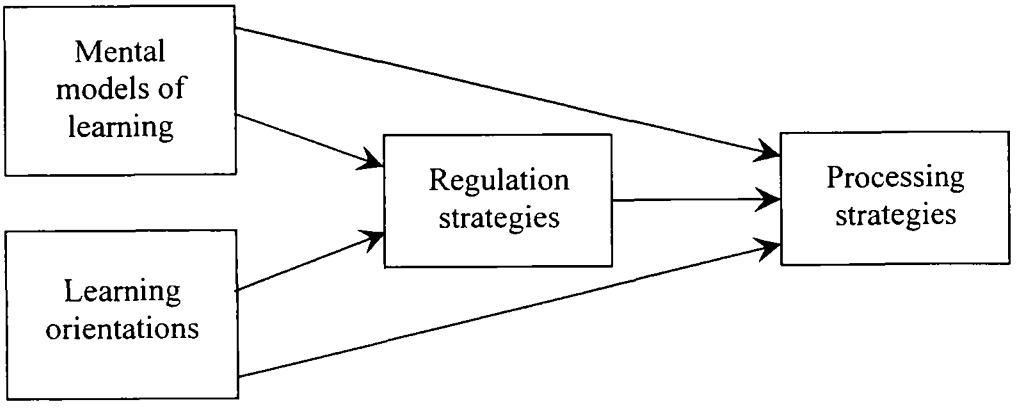

Figure 3.2 The Model of Regulation of Constructive Learning Processes Adapted from Vermunt (1998)

In his early publications, Vermunt used the term 'learning style' as a super-ordinate concept for situations in which consistent associations among the four learning components are found. However, as the term 'learning style' has the disadvantage of giving most people the impression of unchangeable and invariant attributes of students that are deeply rooted in personality, the term 'learning pattern' is proposed as a replacement in Vermunt (2005), to reflect the fact that the associations among learning components are the results of the temporal interplay between personal and contextual influences (p.207). The suggested terminology is adopted in this document.

In several studies, Vermunt found four learning patterns: *reproduction-directed*, *meaning-directed*, *undirected* and *application-directed* learning. The reproduction-directed learning pattern is characterized by the use of a surface approach to learning (e.g. *Memorizing*), a strategy of *External Regulation*, a learning concept based on *Intake of Knowledge* and a *Self-test Directed* or *Certificate Directed* learning orientation. The meaning-directed learning style is characterized by the use of a deep approach to learning (e.g. *Relating and Structuring* and *Critical Processing*), a strategy of *Self-regulation*, a *Construction of Knowledge* learning concept and a *Personally Interested* learning orientation. The undirected learning pattern unites *Lack of Regulation* and *Ambivalent* with a conception of learning characterized by *Cooperative Learning* and *Stimulating Education*. Finally, the application-directed learning pattern links vocational learning orientation to *Concrete Processing* and a conception of learning characterized by *Use of Knowledge*.

In the ILS, items for the processing and regulation strategies are scored on a five-point Likert scale, enabling the respondents to indicate their agreement or disagreement with scores ranging from (1) 'I never or hardly ever did this' to (5) 'I (almost) always did this.' For learning orientations and conceptions of learning, scores range from (1) 'I completely disagree' to (5) 'I completely agree'. No item is reverse scaled, so the meaning of ever item is interpreted in its positive sense.

An extensive survey of the ILS can be found in Vermunt and Vermetten (2004). The author was of the view that the ILS is an appropriate means to operationalize most of the constructs in the personological-domain part of the reference framework for the present research, as mentioned in Section 3.1.1 above. Between the two versions of the ILS, the ILS100 was selected for adaptation in the development of the research instrument for the present study, aiming at a more economical design of the instrument to reduce the possibility of questionnaire fatigue on the part of the students participating in the investigation.

3.2.3 Development of the Research Instrument

3.2.3.1 The Adaptation Process

In adapting the CEQ36 and the ILS100 for the construction of the research instrument, a vital decision was to determine the time span over which the students should reflect on and externalize their learning experiences. In its original design, the CEQ asks students to report on their perception of the teaching quality of a programme after its completion. Accordingly, students in responding to the CEQ have to average their answers across several teachers over the whole duration of a degree programme, which typically lasts for three to four years. In its original design, the ILS asks students to report on their general ways of learning, without indicating a specific time span for students' reflection.

It should be noted that there are reported modifications of the CEQ to collect student feedback within a shorter time span, such as the adaptation made by the Curtin University of Technology Teaching Learning Group for using the CEQ at the course-specific level to complement the Students' Evaluation of Educational Quality (SEEQ) (Marsh, 1987) in the evaluation of individual teachers, as reported in Richardson (2005a: 398). In some work of Vermunt and his team, the ILS has also been modified to collect feedback from students with an explicitly indicated time span for their reflection, at either the course-specific level (Vermetten *et al.*, 1999a) or the semester-specific level (Vermetten *et al.*, 1999b).

In determining the time span for the CEQ part of the research instrument, the author accepted the conclusion in Ramsden (1991a) that "students are quite capable of providing a general rating averaged over several staff, just as electors have no difficulty in voting for one political party despite their awareness of differences between its members" (p.137), but also believed that a shorter time span such as a semester (which typically lasts for three to four months) should reduce the possibility of data compromising by limiting the scope of learning situations for students to average their perceptions. For the ILS part, it was expected that the explicit indication of a time span such as a semester should not affect the validity of the collected data, but should facilitate students in the reflection of their learning experiences. In the light of these considerations, the time span for responding to instrument items in the present study was set at the *semester-specific* level, and the participating students were asked to report on the perceptions and experiences in their studies specifically about *the past semester*.

The language of the research instrument was also a concern in the adaptation process. In view of the low English proficiency of some participating students, the author decided to translate the CEQ36 and the ILS100 into Chinese before their incorporation into the instrument for local administration. Two students studying translation and interpretation were approached for assistance in the translation process. One student translated the instruments from English to Chinese, and the other student translated the Chinese versions back to English for verification, with the author coordinating the translation work of the students, and making minor correction to words if needed.

In addition, minor changes to some wording of the instrument items were also made so as to fit the local response context. For example, the term 'higher education' was replaced by 'post-secondary education,' as in most published articles in Hong Kong the former term refers to education at the degree and upper levels, and the latter term refers to education after Secondary 5, corresponding to the targeted level for investigation. Instead of referring to the whole programme in Australia (and used in that sense in the CEQ), the term 'course' refers to a single subject/unit in Hong Kong, and the wording of the questionnaire items concerned were therefore amended accordingly to reflect this local convention. As a result of the adaptation process, the English version of the research instrument is included as Appendix III for reference. All changes of wording made to the CEQ36 and the ILS100 are highlighted in bold type for easy reference. The Chinese version of the research instrument, which was the one administrated for data collection, is included as Appendix IV for reference.

3.2.3.2 The Resultant Instrument

As shown in Appendix III, the resultant research instrument comprises 146 items and is divided into four parts. Part A aims to collect students' self-reflection on their study activities. It comprises 50 items (from Item 1 to Item 50) assessing the observables related to the *processing strategies* and *regulation strategies* components of the ILS100.

Part B aims to collect students' self-reflection on their study motives and views on studying. It is divided into two sections: B1 and B2. Section B1 comprises 25 items (from Item 51 to Item 75) assessing the observables related to the *learning orientations* component of the ILS100. Section B2 comprises 25 items (from Item 76 to Item 100) assessing the observables related to the *conceptions of learning* component of the ILS100.

Part C comprises 37 items (from Item 101 to Item 137). Items 101 to 136 aim to collect students' perceptions of the learning context by assessing the observables related to the CEQ36. Item 137 is the additional item to assess students' overall satisfaction with the quality of the learning context, which was used in some reported studies as a simple means for the criterion-related-validity checking of the CEQ (cf. Section 3.2.1 above).

Part D comprises nine items (from Item 138 to Item 146) and aims to collect the following demographic and other background information from students:

- Age;
- Gender;
- Kind of programme being studied;

- Current year of study;
- Major subject area of programme;
- Prior academic performance before studying the programme;
- Perceived difficulty level of the programme;
- Level of interest in the programme; and
- Expected performance in the programme.

These background items add further dimensions to the investigative domain not covered by the CEQ36 and the ILS100. For example, the 'age', 'gender' and 'prior academic performance' of students may also be influential observables from the personological domain. The 'kind' and 'subject area' of programmes may also be influential observables from the contextual domain. Moreover, the expected performance of students can be used as a proxy for the construct of 'learning outcome(s)', enabling the present study to make initial investigation into its relationships with the other relevant components in the reference framework.

3.3 Data Collection

3.3.1 Platform of the Investigation

Students who took part in the present study came from six institutions of the Caritas Adult and Higher Education Service (CAHES)[14], an organization which operates under the auspices of Caritas Education Services (CES) of Caritas – Hong Kong. Caritas – Hong Kong is a multi-service organization founded by the Catholic Diocese of Hong

[14] Caritas Adult and Higher Education Service (CAHES) was renamed as Caritas Community and Higher Education Service (CCHES) on 1 September 2007.

Kong in July 1953. It provides wide-ranging services, including social work, education, medical care, community development and hospitality (i.e. hotel and catering). Within Caritas – Hong Kong, CES is responsible for the operation of educational services. It seeks to complement the educational undertakings of the Catholic Diocese of Hong Kong for primary and secondary schooling, through the provision of a diversified range of educational services, including pre-school, junior secondary, senior secondary, special education, and adult and higher education. CAHES was established in 1963 as a division of CES. It offers programmes ranging from basic literacy to higher education to cater for the needs of both adults and students of the relevant age group.

In line with the mission of Caritas – Hong Kong, a major component of the educational services provided by the institutions under CAHES also forms an integral part of the post-secondary education system in Hong Kong, with a special focus on the needs of the so-called 3Ls (i.e. the Lost, the Last and the Least) in the local community, by making the appropriate forms of post-secondary education accessible to them. These 3Ls are low academic achievers or 'late bloomers' who may not have had an opportunity to seek and attain academic, vocational and professional development through the normal paths of progression in formal education.

When the instrument was administrated to collect data from the participating students, all of them were studying full-time post-secondary programmes of various types, including sub-degree programmes such as Associate Degree (AD) and Higher Diploma (HD), vocational programmes such as Certificate and Diploma, foundation programmes such as the Project Yi Jin ('Yi Jin' means 'to proceed with perseverance'), and top-up degree programmes which are typically the last one or two years of the Bachelor's degree programmes offered by overseas universities in Hong Kong. These programmes are meant to constitute an educational ladder for the group of Secondary-5 school leavers who are deemed as academically less capable than their counterparts who aim to gain admission into universities via senior secondary schooling, in view of their attainments in the Hong Kong Certificate of Education Examination (HKCEE). The HKCEE is the public examination for Hong Kong students upon completion of Secondary 5, which is equivalent to the General Certificate of Education (GCE) O-Level Examination in the UK.

Secondary-5 school leavers with low achievements in the HKCEE (even attaining no pass in any subject) can study the foundation programme Project Yi Jin for one year. Graduation from Project Yi Jin is deemed as equivalent to 'satisfactory completion of Secondary 5' (i.e. the attainment of five passes in the HKCEE) for the purposes of employment or further studies. These students can also follow other alternative routes by studying the vocational programmes, which typically lead to a Certificate after one year of study, and a Diploma after another year. Students who have satisfactorily completed Secondary 5 (i.e. having attained five passes in the HKCEE or having successfully completed the Project Yi Jin) can study the sub-degree programmes, which typically take three to four years of study for the award of an AD or a HD. Besides satisfactory completion of secondary education, there are in fact other alternative routes for admitting students with slightly lower attainments or students holding a Certificate or Diploma into the first or second year of a sub-degree programme. Sub-degree programmes aim to prepare students for development as paraprofessionals in the relevant fields, or for academic advancement to university education typically trough the top-up degree programmes.

It is worth reiterating that in the recent reform of post-secondary education in Hong Kong (EC, 1999), a focus for the expansion of educational provisions is at the sub-degree sector (cf. Chapter 1). As a result, since the year 2000, there has been a proliferation of programmes in this sector, with the majority being offered by the continuing education or community education sections of the local universities, and the Institute of Vocational Education (IVE) in Hong Kong. Recent surveys of post-secondary education in Hong Kong can be found in EMB (2006) and EDB (2008). Although the present study was only conducted at some institutions under CAHES, in view of the similar nature and orientation of all the post-secondary programmes being offered in Hong Kong, there is a reasonable expectation that the results of the present study might extend to the other institutions under CAHES as well as most of the above-mentioned providers in the sector.

3.3.2 Sampling Strategy and Administration of Instrument

The objects for the present study is the group of students studying the post-secondary programmes offered in the 2004-05 academic year by the six participating institutions under CAHES. Precise enrolment data of these programmes was not collected. However, the total student enrolment (i.e. the size of the population) was estimated as around 2,500, based on the number of instruments requested by the individual institutions for use in the study, a number which should be slightly more than the actual student enrolment of the relevant programmes at that time.

With the assistance of teachers from the participating institutions, convenience samples were taken during the period from March to May 2005, with the aim to involve most students of the population in the study. The instrument with a cover letter from the author was distributed to the students in class. On behalf of the author, the teachers briefed the students to explain the purpose and nature of the study, and to advise them that their participation in the study was voluntary, and confidentiality of data and anonymity of their identity would be maintained. As reported by the contact person from each institution, most of the returned instruments were distributed and then completed immediately by students during class time. In some cases, students were allowed to complete the instruments after class and return them after a few days.

3.3.3 Handling of Raw Data

When the completed instruments were returned from the participating institutions, the author conducted a visual inspection on each of them and excluded those that were deemed as invalid for data entry. A return from student was deemed as invalid if it contained more than three missing responses, or if there was any sign of possibly malicious acts on the part of the respondent, which usually manifested as an unreasonably regular pattern of responses (e.g., the items on a whole page of the instrument being responded with the same answer). The returns from students that were deemed as valid were then entered into the data file. Table 3.3 shows the estimated response rates for the participating institutions, derived from the estimated student enrolment in the relevant programmes at the individual institutions and the number of valid returns collected from them. To maintain anonymity, the participating institutions are indicated as Institutions A to F in this document.

Table 3.3 Estimated response rates for participating institutions			
Institution	Estimated Student Enrolment	Number of Valid Returns	Response Rate (%)
A	141	111	78.7%
B	1,129	686	60.8%
C	338	217	64.2%
D	300	171	57.0%
E	300	166	55.3%
F	307	221	72.0%
Overall	2,515	1,572	62.5%

All the responses to instrument items were entered as numbers in the data file. For Items 1 to 137, the value of a response was in the range from 1 to 5 as mentioned in Sections 3.2.1 and 3.2.2 above. The values of the responses to Items 138 to 146 are indicated in Appendix III. The distribution of responses for each instrument item (see Appendix V) was then calculated to facilitate initial data inspection and possible error detection.

The value of a CEQ or ILS scale was calculated as the average of the response values of its constituent items, with the values of negated items being reversed beforehand (i.e. 1, 2, 3, 4 and 5 became 5, 4, 3, 2 and 1 respectively). No scale in any student's return had more than one missing item value. Where such single missing item values were present, scale scores were calculated as the average of the response values of the remaining items.

3.4 Key Issues to Be Addressed

As listed in Chapter 1, the research questions of the present study can be broadly classified into two groups. The primary research question (i.e. Question 1) concerns the validity and reliability issues arising from the administration of the research instrument in its intended response context. The secondary research questions (i.e. Questions 2 and 3) explore for relevant interrelationships among the conceptions in the reference framework, to empirically verify the applicability of the model in the new context and to shed light on the phenomena of interest in the present study.

It is reasonable to expect that people will only have confidence in the evaluative data of a study to the extent that they have confidence in the instrument itself (Wilson *et al.*, 1997:34). As the CEQ-portion and ILS-portion of the research instrument have been (slightly) modified and applied in a new response context, it is imperative to establish the validity and reliability of the scales of the instrument so as to sustain the credibility of the research results. As mentioned in Chapter 1, it is a purpose of the present study to address the criticism of poor instrument design in the data collection exercises commonly conducted by many higher education institutions (Rowley, 1995; Leckey and Neill, 2001). To ascertain the psychometric properties of the instrument is therefore desirable, especially in view of the intention of the author to, after the investigation, incorporate the appropriate instrument scales into a practical system for regular use in formal quality assurance (QA) endeavors, as suggested in Chapter 6.

3.5 Methods of Analysis

The major analytical procedures employed in the present study are as follows:

- To test the *reliability* of the instrument (measured by *internal consistency*), Conbach's coefficient alphas for its constituent scales were derived and compared with those reported in the other related research enquiries;

- To establish the *construct validity* of the instrument, exploratory factor analyses were conducted and the results were compared with those reported in the other related research enquiries;

- To test the *discriminant validity*[15] of the relevant scales, multivariate and univariate analyses of variance (MANOVA and ANOVA) were conducted on the scale scores for students of different institutions or students pursuing study programmes of different types and subject areas;

- To test the *strength of associations* between the relevant aspects of the learning contexts, learning patterns and learning outcomes, partial correlation analyses were conducted between the observables involved; and

- To investigate the *interrelationships* of the observables in a more in-depth manner, multiple regression analyses were conducted on the sample data.

[15] In the present study, discriminant validity refers to an instrument's capacity to make appropriate discrimination in terms of their explicit objectives (e.g., being able to discriminate between different institutions or programmes with different teaching philosophies and methods), as suggested by Wilson *et al.* (1997:45). It should be noted that in some research (e.g., Brown *et al.*, 1993), discriminant validity has a different interpretation, which refers to 'the degree to which measures of theoretically unrelated constructs do not correlate too highly with one another' (p. 130).

3.6 Limitations of the Investigation

3.6.1 Validity of Self-Reports

It is understandable that in most investigation of this nature, there may be some students completing the instrument in a hurried and relatively careless manner. Controlling the length of the instrument to avoid questionnaire fatigue (as mentioned in Section 3.2.2), and conducting visual inspection of the completed instruments to exclude those with invalid responses from data entry (as mentioned in Section 3.3.3) are the basic steps adopted in the present study to protect the integrity of the collected data.

However, a more fundamental issue raised by some researchers concerns the validity of students' self-reports (e.g., Pascarella, 2001). This concern is not about students' honesty in responding to instrument items, but on their abilities to provide accurate responses without being affected by extraneous factors.

Instruments like the CEQ and the ILS are intended to assess students' general perceptions of the learning environment and their predispositions to engage in learning, basing on self-reports that require students to give cumulative and retrospective accounts of past experiences which they have typically obtained from different contexts over a long or unspecified period of time. As mentioned in Section 3.2.3.1, the author agrees with Ramsden in opining that students should be quite capable of averaging their experiences in their cumulative ratings, and in the present study the specification of the past semester as the time span for students' reflection should further improve the accuracy of their responses. However, some research results have indicated that under certain circumstances students may reconstruct their autobiographical memories to fit an implicit yet invalid theory about their past experiences. As cited in Richardson (2004), an example is the study conducted by Conway and Ross in 1984 where it was found that students who have taken a study-skills programme rated their skills as having improved, with the real reason being the students' denigration of their former skills through retrospective ratings, not the actual improvements in their skills after the programme (p.354-355).

Nevertheless, although there is concern about this aspect, there is also a general acceptance among most researchers that student feedback via self-reports on their past experiences can be quite accurate, especially if the reported data are low-inference and factual items (Pascarella, 2001), and can offer useful results to inform an institution's QA endeavor (Richardson, 2005a). The attempt to ascertain the desirable psychometric properties of the research instrument in the new response context, as suggested in Richardson (2004:353) and practiced in the present study, should further alleviate this concern.

3.6.2 Problem of Response Bias

Another important issue concerns the extent to which students who have not returned their instruments would have exhibited basically the same distribution of responses as did the returnees. For administrative reasons related to access and management of relevant data within the participating institutions, it was not possible to explore this issue.

Nevertheless, it is worth noting that the overall response rate of 62.5% for the present study is satisfactory (cf. Section 3.3.3), and that during the administration of the research instrument, there was an absence of pre-selection or self-selection of participating students. There is thus a reasonable expectation that the resulting sample approximates a random sample, as there were no set criteria or procedures for the inclusion or exclusion of subjects (Tam, 2004: 253). In view of this, the concern about possible response bias in the present study can be largely alleviated.

3.6.3 Problem of Generalisability

Although not explicitly mentioned, the present study is meant to shed light on the general phenomena of student learning in the post-secondary education sector of Hong Kong. However, due to the limited capacity of the author to involve the entire sector, the platform of the investigation was confined to six institutions of CAHES, which is a division of CES operating under the auspices of Caritas – Hong Kong. There should be a concern about the generalisability of the investigative results for the whole sector. However, as mentioned in Section 3.3.1, the similar nature and orientation of all the post-secondary programmes being offered in Hong Kong may help alleviate this concern. Nevertheless, to crosscheck with the present research, the conduct of further investigation in a wider range of institutions within the sector is certainly advisable in the future.

3.6.4 Problem of Causal Ambiguity

As noted by many researchers, correlational studies (such as the present study) suffer from the inherent problem of ambiguity in causal direction. "Explanation of research results is made difficult by the ambiguous causal linkages and directionality of influence, which demands caution in making causal inferences." (Tam, 2001b: 82). It is well known that when there is a correlation between phenomenon A and phenomenon B, it is possible that either A causes B, or B causes A, or in fact there is another phenomenon C which causes both A and B.

Despite the above limitation of correlation studies it should be noted that, with the appropriate limitations being imposed on the design of the research (e.g. focusing on just a few constructs at one time), an investigation is still able to make more explicit the possible causal links among the constructs, and based on tests of statistical significance infer the possible *direct*, *indirect* and/or *spurious effects* among them. An example can be found in the published work of Richardson (2006, 2007). Such an approach to inferring possible causal effects among the relevant observables was also attempted in the present study, and is reported in Chapter 5.

3.6.5 Limitation of Concurrent Validity Criteria

In the research instrument, Item 137 collects students' overall satisfaction of the courses they took in the semester under investigation, and Item 146 asks students to predict their performance in that academic year. Adopting from the original design of the CEQ, students' responses to Item 137 were used as a criterion for testing the concurrent validity of the relevant scales. However, it should be noted that a more formal treatment for estimating student satisfaction should be based on consumer theory, which maintains that the difference between consumers' expectations and perceptions determines their level of satisfaction with the quality of provision of a service. Moreover, in the consideration of this issue the following remark of Richardson should be noted:

In fact the limited amount of research on this topic suggests that student satisfaction is a complex yet poorly articulated idea that is influenced by a wide variety of contextual factors that are not intrinsically related to the quality of teaching (Wiers-Jenssen *et al.*, 2002). On theoretical grounds, it is not at all clear that satisfaction should be a desirable outcome of higher education, let alone that it should be liken to a commodity or service.

(Richardson, 2005a: 403)

Students' responses to Item 146 were used not only as another criterion for testing concurrent validity, but also as a proxy for the observable 'learning outcome(s)'. Due to resource constraints and the author's limited accessibility to the relevant data of the participating institutions, an intention to collect students' actual performance could not be realized. An element of caution is therefore necessary when the evaluative results of the present study concerning learning outcomes are interpreted.

3.6.6 Abandonment of Design for Longitudinal Study

Finally, it is worth mentioning that in its original design, the present study had planned for a simple longitudinal study with the aim to collect data twice from the students who were willing to participate, and to use students' identity numbers to match individual-specific data obtained from the two collections. At the end of the research instrument, a simple 'consent of student' section was added for the said purpose, similar to the design in Tam (2001b). However, mainly due to considerations of resource and time constraints, the likely low participation rate in obtaining matched data and the other problems of such a design, this longitudinal aspect of the study was eventually abandoned.

The preceding chapter has described the general design of the empirical investigation for the present study, the adaptation of the CEQ and the ILS to form the research instrument, the sampling strategy and data collection process, and the limitation of the methodology adopted in the investigation. This chapter attempts to answer the first research question of the study through the validation of the research instrument for its intended context of investigation. To validate the research instrument, extensive statistical analyses were conducted to establish its relevant psychometric properties, using the program SPSS for Windows Version 14.0 (Norušis, 2006).

4.1 Validating the CEQ Scales of the Instrument

Several types of analysis were carried out in order to examine the properties of the CEQ-portion of the instrument and its scales, including Cronbach's coefficient alpha, item-total statistics and exploratory factor analysis. The results are summarized in the remaining parts of this subsection, and are compared to the results of similar published studies. The subsection ends with a discussion of the findings of this validating process.

4.1.1 Reliability

The reliabilities of the CEQ scales of the instrument were calculated using Cronbach's coefficient alphas. The results are shown in Table 4.1, which also indicates the means and standard deviations of the scale scores. It was found that in the adaptation of the CEQ for the present study, the internal consistency of *Good Teaching* and *Generic Skills* is satisfactory, that of *Appropriate Workload* and *Appropriate Assessment* is marginally acceptable, but that of *Clear Goals and Standards* and *Emphasis on Independence* is unsatisfactory.

It should be noted that a review of studies using the CEQ has been reported as part of Richardson (2005a). The coefficient alphas of the scales in the studies reviewed were considered as 'generally satisfactory' (p.396). However, these reviewed studies were mainly conducted in Australia, Britain and Canada, and the author is not aware of any published study in Asian countries or cities that has employed the CEQ. The original findings of the present study, conducted using the CEQ in the context of post-secondary education in Hong Kong to investigate Chinese students' perceptions of the teaching quality of their programmes, may therefore be seen as an important contribution to the CEQ literature.

Table 4.1 Means, standard derivations and coefficient alphas of the CEQ Scales (n = 1572)

CEQ Scale	Mean	Standard Derivation	Alpha
Good Teaching	3.22	0.58	0.77
Clear Goals and Standards	3.03	0.46	**0.23**
Appropriate Workload	2.97	0.59	0.55
Appropriate Assessment	2.87	0.56	0.60
Emphasis on Independence	2.98	0.50	**0.47**
Generic Skills	3.32	0.63	0.78

Before further analyses were conducted, the coefficient alphas of the scales in the present study were compared to those in some of the reported studies, namely Ramsden (1991a), Richardson (1994b) and Wilson *et al.* (1997), as shown in Table 4.2. It can be seen that the alpha values of the CEQ scales in the present study are generally *lower* than those of the reported studies, a finding that compromises the transferability of these scales to a different (Hong Kong) cultural response context. There is a clear indication that future studies employing the CEQ in a similar response context will need to carefully retrial and validate CEQ items and, in doing so, be open to admitting new words and phrases to best capture the variations within the posited constructs. It may also be that some of the CEQ constructs are simply not valid in such a response context. Moreover, it should be noted that Richardson (1994b) was a study in a British context with a small sample (n=95) aimed to crosscheck with the original CEQ study in an Australian context (Ramsden, 1991a). Although the response contexts of these two studies were arguably similar in culture, Richardson's study reported unsatisfactory reliability for *Appropriate Assessment*, and a similar result as the present study for *Emphasis on Independence*, further suggesting the need for attention to *cultural aspects* in adapting the CEQ scales to a different context.

The original design intention of the CEQ was to collect student feedback on programme quality after completion of study (typically 3 to 4 years in duration). In the present study this time span is compressed to one semester, and there must clearly be doubt as to whether scale reliability might be affected by such a change. It is unlikely that an explanation for the low reliability of some scales is the shorter time span across which students have to average their experiences in responding to the instrument items. Instead of the whole programme duration in the original CEQ design intention, the shorter time span of one semester in the present study should in fact facilitate students in making more consistent responses.

Table 4.2 CEQ scales – comparison of coefficient alphas with other studies						
			Wilson *et al.* (1997)			
CEQ Scale	Ramsden (1991a) (n=3372)	Richardson (1994b) (n=95)	1992 Sample (n=1362)	1993 Sample (n=2130)	1994 Sample (n=7370)	Present Study (n=1572)
GT	0.87	0.79	0.88	0.86	0.88	0.77
CG	0.80	0.77	0.76	0.82	0.82	**0.23**
AW	0.77	0.71	0.69	0.74	0.74	0.55
AA	0.71	**0.47**	0.70	0.73	0.73	0.60
IN	0.72	0.55	X	0.67	0.67	**0.47**
GS	X	X	0.77	0.79	0.79	0.78

CEQ Scale: GT - Good Teaching; CG - Clear Goals and Standards; AW - Appropriate Workload; AA - Appropriate Assessment; IN - Emphasis on Independence; GS - Generic Skills
Note: X - Scale not examined in the study concerned

However, there may be a concern about scale reliability in the present study being affected by the responses from first-year students, who were the majority of the sample (Note: 1,019 out of 1,572 students, i.e. 64.8% of the sample) and who have just transited from secondary to post-secondary study. It could be argued that these students might not be qualified to comment on the relevant aspects of their programmes after just one semester.

To explore this possibility, the original sample was split into a sub-sample comprising first-year students and another sub-sample comprising all the other students, with the coefficient alphas of the CEQ scales re-calculated for the two sub-samples. The results are summarized in Table 4.3 below. It can be seen that except for *Clear Goals and Standards* and *Emphasis on Independence*, the values in the two sub-samples are broadly comparable with each other, and are not substantially different from the corresponding values in the original sample, suggesting that sub-sample bias might have partially contributed to, but is not be a major explanatory source for, the low reliability of most scales.

Table 4.3 CEQ scales – comparison of coefficient alphas of sub-samples						
	GT	CG	AW	AA	IN	GS
Sub-sample 1, first-year students (n=1019)	0.77	0.11	0.51	0.63	0.39	0.78
Sub-sample 2, all the other students (n=553)	0.79	0.40	0.59	0.56	0.54	0.77
Original sample (n=1572)	0.77	0.23	0.55	0.60	0.47	0.78

CEQ Scale: GT - Good Teaching; CG - Clear Goals and Standards; AW - Appropriate Workload; AA - Appropriate Assessment; IN - Emphasis on Independence; GS - Generic Skills

The exploration for possible explanatory sources was then turned to the integrity of the individual CEQ scales. In this regard, exploratory factor analysis was conducted for each of the scales, applying the eigenvalue-greater-than-one rule in principal components analysis to determine the number of factors. It was found that each of the *Appropriate Assessment*, *Generic Skills* and *Good Teaching* scales exhibits as one factor only.

Appropriate Workload exhibits as two factors; the first factor (*AW1*) comprises Item 105, Item 114, Item 127 and Item 136, and the second factor (*AW2*) comprises Item 119. Analysis of the item descriptions revealed that *AW1* is about the workload and course content, and *AW2* is about the time to understand the learned content, which for some students in the local context may not be as directly related to the concept of workload as *AW1*. The analysis was also confirmed by the item-total statistics. With the removal of Item 119, the alpha value of *Appropriate Workload* increases from 0.55 to 0.65.

Clear Goals and Standards exhibits as two factors; the first factor (*CG1*) comprises Item 101, Item 108 and Item 135, and the second factor (*CG2*) comprises Item 118 and Item 124. Analysis of the item descriptions revealed that *CG1* is about expectations on students from the perspective of 'the whole school' or 'the teachers' and *CG2* is about expectations on students from the perspective of 'the courses'. While in the original design of the CEQ these two parts are of the same level, the adaptation of the CEQ for the present study has confined 'the courses' in *CG2* to those within the semester concerned, thus setting the related expectations on students at a lower level and of a narrower scope than those of *CG1*. In further statistical analysis, the removal of Item 118 or Item 124 from the original scale resulted in negligible improvement of the alpha value. The alpha value of *CG1* and *CG2* was 0.46 and 0.45 respectively, although better than the alpha value of the original scale (0.23), they are still unsatisfactory.

Emphasis on Independence exhibits as two factors; the first factor (*IN1*) comprises Item 115, Item 116, Item 121 and Item 130, and the second factor (*IN2*) comprises Item 103 and Item 134. Analysis of the item descriptions revealed that *IN1* is about students' development of academic interest and choices in the learning process, and *IN2* is about choices in subject areas and assessment methods of which post-secondary students, unlike their university counterparts, should have less experience. In further statistical analysis, the removal of Item 103 or Item 134 slightly improved the alpha value of the original scale. The alpha value of *IN1* is 0.64, rendering it more reliable than the original scale. The alpha value of *IN2* is 0.38, indicating insufficient integrity as its constituent items may in fact be related to two separate concepts.

It is also interesting to note that in the factoring of *Appropriate Assessment*, *Clear Goals and Standards* and *Emphasis on Independence*, the first factor always comprises all the items specified in their ordinary sense, and the second factor always comprises all the items specified in their negated sense (i.e. the reverse-scaled items). As in the research instrument the ILS-portion (comprising 100 items) precedes the CEQ-portion, whether the above-found pattern is an indication of insufficient attention to the negated sense of the reverse-scaled items due to questionnaire fatigue on the part of the responding students, and whether it may have partially contributed to the low reliability of some CEQ scales deserves further investigation in the future[16].

4.1.2 Validity

The internal structure of the CEQ was investigated mainly through exploratory factor analysis at the *item* level. Conceptually (and empirically, from other studies) there is an expectation that responses to CEQ scales and their constituent items will not be independent of one another. For this reason *common factor analysis* instead of *principal components analysis* was selected as the statistical model for the investigation. Under this model, a key step was to determine the number of factors to be extracted. As suggested in Richardson (1994b:62), there are three methods for doing so: (a) the application of the eigenvalue-greater-than-one rule as in principal components analysis, (b) the scree plot and (c) the over-factoring method which extracts more factors than are indicated by some criterion and then deletes those factors failing to yield salient loadings (e.g. loadings typically greater than 0.3).

In the factor extraction phase, the eigenvalue-greater-than-one rule identified seven factors. However, as noted in Costello and Osborne (2005), this rule may be inaccurate and often overestimates the number of factors. Both the scree plot and the over-factoring method indicated that only four factors should be extracted, and these factors explain 38.37% of the total variance. In the factor rotation phase, the four factors were subject to oblique rotation, using *Maximum Likelihood* as the extraction method and *Oblimin with Kaiser Normalization* as the rotation method. It is noteworthy that in the

[16] Some researchers have advised that to avoid confusing the respondents, reverse-scaled items should not be used (especially for long research instruments), and that if reverse-scaled items are used, a warning should be given to the respondents, see Robinson (1999:29) for more detail.

case of oblique solutions, the focus of interest is the loadings in the *pattern matrix* which show the unique contribution each factor makes to the variance of the observables, and are akin to regression coefficients. Of less interest is the *structure matrix* whose loadings show the simple correlations between each factor and the various observables, and which are therefore contaminated by correlations between the factors (Meyer *et al.*, 1994:474). In view of this, after the rotation all the loadings from the pattern matrix for a factor are reorganized for better presentation and for facilitation of factor interpretation, with loadings of an absolute value of 0.3 or more shown in bold type for easy reference. For the sake of completeness, the corresponding loadings from the structure matrix are also included and are shown in parentheses for comparison.

The results are presented in Table 4.4. In this table, only Item 134 fails to load saliently on any factor. Item 104 cross-loads on two factors, and is associated with the third factor as it is of the higher loading. All shown items are ranked in descending order of their factor loadings from the pattern matrix, and are denoted with the original CEQ scale to which they belong.

As can be seen from Table 4.4, the first factor (which explains 17.93% of the total variance) should be interpreted as *Good Teaching*, as six of the eight items from the original scale load on this factor, with most of them being ranked at the top. The second factor (which explains 8.23% of the total variance) should be interpreted as *Appropriate Workload*, as four of the five items from the original scale load on this factor, all being ranked at the top. The third factor (which explains 2.44% of the total variance) should be interpreted as *Generic Skills*, as all the six items from the original scale load on this factor and occupy the top six places in the ranking.

Table 4.4 Results of factor analysis on CEQ item scores					
Item	Original CEQ Scales	Factor			
		1	2	3	4
Item 120	GT	**0.66** (0.67)	-0.07 (-0.06)	0.01 (0.36)	-0.14 (-0.13)
Item 122	GT	**0.64** (0.68)	-0.07 (-0.08)	0.05 (0.40)	-0.13 (-0.12)
Item 121	IN	**0.56** (0.54)	0.03 (-0.04)	-0.03 (0.28)	0.15 (0.12)
Item 123	GT	**0.54** (0.62)	-0.09 (-0.10)	0.13 (0.42)	-0.18 (-0.16)
Item 130	IN	**0.53** (0.54)	-0.05 (-0.09)	0.02 (0.31)	0.03 (0.03)
Item 119	AW	**0.52** (0.53)	0.18 (0.05)	0.06 (0.30)	0.25 (0.18)
Item 125	GT	**0.46** (0.56)	-0.08 (-0.10)	0.18 (0.43)	-0.16 (-0.13)
Item 133	GT	**0.40** (0.50)	0.02 (-0.09)	0.19 (0.41)	0.09 (0.09)
Item 116	IN	**0.39** (0.49)	0.05 (-0.08)	0.21 (0.41)	0.13 (0.12)
Item 109	GT	**0.37** (0.44)	-0.19 (-0.19)	0.10 (0.34)	-0.15 (-0.09)
Item 135	CG	**0.31** (0.40)	-0.17 (-0.22)	0.15 (0.36)	-0.05 (0.02)
Item 108	CG	**0.31** (0.42)	-0.03 (-0.15)	0.22 (0.40)	0.10 (0.13)
Item 127*	AW	-0.02 (0.00)	**0.61** (0.58)	0.09 (-0.10)	0.02 (-0.17)
Item 105*	AW	-0.03 (-0.05)	**0.59** (0.57)	0.03 (-0.17)	0.05 (-0.15)
Item 136*	AW	-0.09 (-0.09)	**0.54** (0.53)	0.05 (-0.16)	-0.01 (-0.18)
Item 114*	AW	-0.06 (-0.13)	**0.46** (0.50)	-0.08 (-0.26)	-0.04 (-0.20)
Item 118*	CG	-0.06 (-0.07)	**0.40** (0.46)	0.01 (-0.17)	-0.19 (-0.32)
Item 117*	AA	0.09 (0.02)	**0.36** (0.46)	-0.10 (-0.19)	-0.22 (-0.36)
Item 126*	AA	-0.09 (-0.13)	**0.33** (0.43)	-0.04 (-0.23)	-0.24 (-0.35)
Item 110*	AA	0.06 (-0.11)	**0.30** (0.38)	-0.29 (-0.35)	0.02 (-0.11)
Item 102	GS	-0.03 (0.34)	-0.00 (-0.18)	**0.69** (0.66)	-0.10 (-0.02)
Item 112	GS	0.12 (0.42)	0.13 (-0.08)	**0.60** (0.62)	0.05 (0.07)
Item 106	GS	0.07 (0.37)	0.05 (-0.15)	**0.59** (0.61)	0.02 (0.07)
Item 111	GS	0.07 (0.37)	-0.06 (-0.22)	**0.55** (0.60)	-0.07 (0.02)
Item 113	GS	0.13 (0.41)	-0.01 (-0.18)	**0.52** (0.59)	-0.02 (0.04)
Item 128	GS	0.17 (0.40)	-0.03 (-0.16)	**0.43** (0.53)	-0.04 (0.02)
Item 115	IN	0.24 (0.45)	0.12 (-0.06)	**0.41** (0.52)	0.09 (0.10)
Item 101	CG	0.08 (0.29)	0.02 (-0.14)	**0.41** (0.46)	0.08 (0.12)
Item 104	GT	**0.30** (0.49)	-0.08 (-0.15)	**0.33** (0.50)	-0.13 (-0.08)
Item 103*	IN	0.18 (0.00)	0.27 (0.38)	**-0.31** (-0.31)	-0.06 (-0.19)
Item 131*	GT	0.20 (0.24)	0.14 (0.28)	0.05 (0.06)	**-0.49** (-0.54)
Item 132*	AA	-0.09 (-0.05)	-0.01 (0.15)	0.05 (-0.05)	**-0.49** (-0.48)
Item 124*	CG	-0.11 (-0.07)	0.33 (0.42)	0.09 (-0.11)	**-0.36** (-0.46)
Item 129*	AA	0.12 (0.03)	0.19 (0.36)	-0.16 (-0.20)	**-0.36** (-0.45)
Item 107*	AA	0.07 (-0.04)	0.21 (0.37)	-0.20 (-0.26)	**-0.30** (-0.39)
Item 134*	IN	0.05 (-0.01)	0.24 (0.36)	-0.10 (-0.18)	-0.26 (-0.35)
Eigenvalue		7.13	3.67	1.54	1.48
% of Variance		17.93	8.23	2.44	2.17
Correlation:	Factor 1	1.00	-.05	0.53	-0.03
	Factor 2		1.00	-0.31	-0.34
	Factor 3			1.00	0.11
	Factor 4				1.00

Original CEQ Scale: GT - Good Teaching; CG - Clear Goals and Standards; AW - Appropriate Workload; AA - Appropriate Assessment; IN - Emphasis on Independence; GS - Generic Skills

Note: Factor loadings ≥ 0.3 or ≤ -0.3 are highlighted in bold type

Before proceeding further with the analysis it is noted that, while the intended CEQ factors were broadly identified as correlated but non-overlapping in the studies by

Ramsden, Richardson and Wilson's groups, there were always reports of items loading on an unintended factor, cross-loading on more than one factor, or failing to load on any factor. For example, in the factor structure reported in Wilson *et al.* (1997) which is the most extensive and confirmative study of the CEQ known to the author, the first factor comprises all eight items from *Good Teaching*, but it also contains two additional items from *Appropriate Assessment* and one item from *Emphasis on Independence* (p.39). In Richardson's (1994b) study of the CEQ using a small sample, eight items fail to load on any factor, and six items load on an unintended factor (p.63). Moreover, *Appropriate Assessment* is defined by only one item (p.65). There were also problems with scale composition in the study of the CEQ in Ramsden (1991b), which could not confirm the original study in Ramsden (1991a), as cited in Richardson (1994b:66).

It should also be noted that, in the present study, the degree of item non-loading or cross-loading is less extensive than in most of the above-mentioned studies. However, the degree of overlapping among the constructs as measured by the CEQ scales is more extensive, resulting in only four factors being explicitly identified, with some of the constructs such as *Clear Goals and Standards* and *Emphasis on Independence* being overshadowed by other more salient constructs and failing to exhibit in the factor structure.

For example, many items from these two original scales load on the first factor, suggesting that, from the perspective of the responding students, the provision of choice and guidance in student learning (i.e. Items 121, 130 and 116 from the original *Emphasis on Independence* scale) and clear communication of expectation to students (i.e. Items 108 and 135 from the original *Clear Goals and Standards* scale) are more associated with the concept of *Good Teaching*.

From the composition of the second factor, it appears that the responding students associate *Assessment* closely with *Workload*, especially in terms of those items related to memorization of facts (i.e. Items 110, 117 and 126 from the original *Appropriate Assessment* scale).

From the third factor, it appears that the responding students associate *Generic Skills* with the development of students' interest (i.e. Item 115 from the original *Emphasis on Independence* scale) and the arousal of students' motivation for learning (i.e. Item 104 from the original *Good Teaching* scale). However, the weak negative loading of the following item on this factor is worth noting:

Item 103: There are few opportunities to choose the particular areas you want to study. (*Emphasis on Independence*)

The loading (-0.31) suggests that insufficient attention may have been paid to reverse-scaled items on the part of the responding students, as raised in Section 4.1.1.

The fourth factor (which explains 2.17% of the total variance) is interesting, as it comprises the following reverse-scaled items with negative loadings:

Item 107: Teachers here frequently give the impression that they have nothing to learn from students. (*Appropriate Assessment*)

Item 124: The aims and objectives of the courses are not made very clear. (*Clear Goals and Standards*)

Item 129: Feedback on student work is usually provided only in the form of marks and grades. (*Appropriate Assessment*)

Item 131: Teachers here show no real interest in what students have to say. (*Good Teaching*)

Item 132: It would be possible to get through the courses just by working hard around exam time. (*Appropriate Assessment*)

A plausible interpretation of this factor is that it captures variations in some aspects of *Bad Teaching* as experienced by some of the responding students, featuring uninterested teachers, unclear course aims and objectives, superficial feedback on students' work and straightforward exams.

As mentioned above, in the present study only the following reverse-scaled item fails to load saliently on any factor:

Item 134: There's very little choice in the courses in the ways you are assessed. (Emphasis on Independence)

A likely explanation is that the issue measured by this item is considered as unimportant by most responding students, as being offered choice in assessment is not a familiar experience in their studies.

Since the CEQ scales in the present study overlap more extensively than in the other reported studies, the correlations of the scales and the factor structure at the scale level were examined while noting the relatively low integrity of *Clear Goals and Standards*, as indicated in Table 4.5. It should be noted that a stronger correlation than reported in Richardson (1994b) is found between *Good Teaching* and each of *Emphasis on Independence* and *Clear Goals and Standards*, and between *Appropriate Assessment* and *Appropriate Workload*; there is also a relatively high correlation between *Good Teaching* and *Generic Skills,* which was not evident in Richardson's study. These results are consistent with the scale-level common factor analysis, which identifies two factors explaining 29.89% and 15.98% respectively of the total variance, with the correlation of the two factors being 0.05 (i.e. basically independent). Unlike most reported studies (e.g., Ramsden, 1991a; Wilson *et al.*, 1997) which identified one single second-order factor as an indicator of programme quality, the finding of the present study is similar to Trigwell and Prosser (1991) in the identification of two second-order factors, one linking good teaching and clear goals with the development of students' generic skills and independence, the other linking appropriate workload with appropriate assessment.

Table 4.5 Correlations and factor analysis of CEQ scale scores

	Correlation Coefficient					Factor (Loadings from Pattern Matrix)	
Scale	CG	AW	AA	IN	GS	1	2
GT	0.39	0.04	-0.04	0.50	0.58	**0.80**	-0.04
CG		0.13	0.10	0.32	0.36	**0.52**	0.13
AW			0.36	0.14	-0.09	0.07	**0.48**
AA				0.07	-0.27	-0.06	**0.76**
IN					0.36	**0.60**	0.13
GS						**0.73**	**-0.34**

CEQ Scale: GT - Good Teaching; CG - Clear Goals and Standards; AW - Appropriate Workload; AA - Appropriate Assessment; IN - Emphasis on Independence; GS - Generic Skills
Note: Factor loadings ≥ 0.3 or ≤ -0.3 are highlighted in bold type

4.1.3 Interim Discussion

It is in fact not surprising that the factor analysis of the CEQ items in the present study only saliently exhibits three of the intended six factors, namely *Good Teaching*, *Appropriate Workload* and *Generic Skills*. Plausible explanations are as follows: (a) in the present study, the scale measuring *Clear Goals and Standards* lacks integrity; (b) in some reported studies such as Richardson (1994b), the scale measuring *Appropriate Assessment* was problematic; and (c) in the local context of post-secondary education in Hong Kong, students' conception and awareness of *Emphasis on Independence* is not sufficiently explicit. There should thus be a moderate degree of confidence that the findings in the present study have acceptably confirmed the validity of the adapted CEQ scales for collecting feedback on the perceptions of programme quality from Chinese students.

The salient identification of *Generic Skills* as a separate factor in the present study should be noted, as this scale was a subsequent addition to the CEQ when it was revised in 1992 (Wilson *et al.*, 1997).

It is clear that there is scope for further development of the CEQ-portion of the instrument if it is to be used in future investigation conducted in the local (Hong Kong) context of the present study. An obvious problem encountered in the present study is the disappointingly low reliability of *Clear Goals and Standards*, noting that relatively high alpha values for this scale have been reported in the other studies. Furthermore, in future revision of the instrument, the construct denoted by this scale should not be adapted directly from the original context, but should be developed by a more fundamental means, such as the derivation of key issues to be measured from qualitative studies conducted in the local context. As for the present study, since the analysis of item-total statistics and further factoring of this scale do not satisfactorily improve its alpha value, it is dropped from the second-stage analyses.

Additionally, in the second-stage analyses Item 109 is removed from *Appropriate Assessment*, improving alpha value to 0.65. Items 103 and 134 are removed from *Emphasis on Independence*, improving alpha value to 0.64. As a result, the reliability of the five remaining CEQ scales is signified by alpha values ranging from 0.60 to 0.78, which are comparable to those reported in other studies, e.g. Ramsden (1991a), Richardson (1994b) and Wilson *et al.* (1997).

The correlations of the revised CEQ scales and the factor structure at the *scale* level are indicated in Table 4.6. Compared to Table 4.5, it can be seen that after the revision the correlations among the related CEQ scales and the loadings of the relevant scales on the respective factors in the factor structure are in general strengthened, with the two factors explaining 28.68% and 28.74% of the total variance respectively. The correlation of the two factors is –0.28, indicating a slight negative relationship between them.

Table 4.6 Correlations and factor analysis of revised CEQ scale scores

	Correlation Coefficient				Factor (Loadings from Pattern Matrix)	
Scale	AW1	AA	IN1	GS	1	2
GT	-0.10	-0.04	0.59	0.58	0.13	**0.86**
AW1		0.44	-0.14	-0.21	**0.46**	-0.06
AA			-0.16	-0.27	**0.95**	0.08
IN1				0.53	-0.03	**0.71**
GS					-0.15	**0.69**

Revised CEQ Scale: GT - Good Teaching; AW1 - Appropriate Workload (revised); AA - Appropriate Assessment; IN1 - Emphasis on Independence (revised); GS - Generic Skills

Note: Factor loadings ≥ 0.3 or ≤ -0.3 are highlighted in bold type

Although for the present study the validation of the adapted CEQ for application in the context of the post-secondary education in Hong Kong is not completely satisfactory, plausible explanations for the differences from previous findings and possible directions for scale revisions in future investigation have initially been identified in most of the cases. These results indicate that the CEQ, with further revision of some scales, should be able to serve as a basis for the design of an instrument for the effective collection of students' perceptions of their learning environment in this new response context.

At this junction it should also be noted that the investigation as reported in Subsection 4.1.2 is only concerned with the concept of construct validity. The validity of the adapted CEQ scales for its intended context of investigation can in fact be further demonstrated via other means. An example of such a means is the concept of *criterion validity*, which can be indicated by demonstrating that the patterns of students' CEQ scores vary in a systematic and meaningful way with a number of other criteria, such as students' overall satisfaction, or students' learning patterns as denoted by their ILS scores. Another example is the concept of *discriminant validity*, which can be indicated by exploring whether the CEQ scales can plausibly discriminate among different programmes in a meaningful manner. To address these issues rigorously requires a sophisticated analytical process (e.g., multi-level data modeling) that lies beyond the scope of the present study. However, initial investigation along these directions will be reported in Chapter 5.

4.2 Validating the ILS Scales of the Instrument

Following Subsection 4.1, analyses were carried out in order to examine the properties of the ILS-portion of the instrument and its scales, including Cronbach's coefficient alpha, item-total statistics and exploratory factor analysis. The results are summarized in the remaining parts of this subsection, and are compared to the results of similar published studies. The subsection ends with a discussion of the findings of this validating process.

4.2.1 Reliability

The reliabilities of the ILS scales of the instrument were measured using Cronbach's coefficient alphas. The results are shown in Table 4.7, which also indicates the means and standard deviations of the scale scores. It was found that, in the adaptation of the ILS for the present study, the internal consistency of the 20 constituent scales is generally satisfactory. The alpha values of these scales vary between 0.62 and 0.78 for processing strategies, between 0.60 and 0.75 for regulation strategies, between 0.63 and 0.75 for conceptions of learning, and between 0.50 and 0.79 for learning orientations, with 12 of them greater than 0.70[17].

It should be noted that a survey on the use of the ILS as a research instrument has recently been reported in Vermunt and Vermetten (2004), which indicates that "from 1992 onward, the ILS was used by researchers in the Netherlands, Belgium, Finland, England, Cyprus, USA, Brazil, Argentine, Indonesia and Sri Lanka" (p.364). The present study should be considered as an addition to these studies, through the

[17] Many researchers consider an alpha value of at least 0.7 as desirable or adequate; however, see Cortina (1993) for more details on the theory and applications of coefficient alpha.

administration of the ILS in the context of post-secondary education in Hong Kong to investigate the learning patterns of Chinese students.

Before further analyses were conducted, the coefficient alphas of the scales in the present study were compared to those in three other studies, namely the original study of the ILS in a Dutch context as reported in Vermunt (1998), the adaptation of it to an Indonesian context as reported in Ajisuksmo and Vermunt (1999) and a cross-checking study of it in a British context as reported in Boyle *et al.* (2003). The results of the comparison are summarized in Table 4.8.

Table 4.7 Means, standard derivations and coefficient alphas of the ILS scales (n=1572)

ILS Scale	Mean	Standard Derivation	Alpha
Processing Strategy:			
Relating and Structuring	2.44	0.67	0.78
Critical Processing	2.38	0.74	0.73
Memorizing and Rehearsing	2.72	0.64	0.62
Analyzing	2.49	0.64	0.73
Concrete Processing	2.77	0.68	0.72
Regulation Strategy:			
Self-regulation of Learning Processes and Results	2.58	0.66	0.75
Self-regulation of Learning Content	2.44	0.75	0.73
External Regulation of Learning Processes	2.71	0.61	0.62
External Regulation of Learning Results	2.82	0.64	0.66
Lack of Regulation	2.78	0.64	0.60
Mental Model of Learning:			
Construction of Knowledge	3.31	0.63	0.71
Intake of Knowledge	3.34	0.64	0.63
Use of Knowledge	3.50	0.67	0.71
Stimulating Education	3.35	0.65	0.75
Cooperative Learning	3.05	0.73	0.73
Learning Orientation:			
Personally Interested	3.19	0.59	0.50
Certificate-oriented	3.46	0.75	0.69
Self-test-oriented	3.29	0.74	0.75
Vocation-oriented	3.70	0.76	0.79
Ambivalent	2.99	0.68	0.65

It can be seen that, while the alpha values of the ILS scales in the present study are generally satisfactory, most of them are lower than the corresponding values reported in

Vermunt (1998), for surveys conducted in the contexts of a regular university (RU) and an open university (OU). In comparing the RU results of Vermunt's study to those of the present study, the scales with a difference in alpha value of 0.1 or more include *Memorizing and Rehearsing* and *Analyzing* for processing strategies, *External Regulation of Learning Process* and *Lack of Regulation* for regulative strategies, *Intake of Knowledge*, *Stimulating Education* and *Cooperative Learning* for mental models of learning, and *Vocation-oriented* and *Ambivalent* for learning orientations. Some plausible explanations for these differences are considered below.

Table 4.8 ILS scales – comparison of coefficient alphas with other studies

ILS Scale	Vermunt (1998) OU (n=654) / RU (n=795)	Ajisuksmo & Vermunt (1999) (n=888)	Boyle *et al.* (2003) (n=156)	Present Study (n=1572)
Processing Strategy:				
Relating and Structuring	0.80 / 0.83	0.76	0.74	0.78
Critical Processing	0.72 / 0.72	0.69	0.74	0.73
Memorizing and Rehearsing	0.79 / 0.79	0.58	0.74	0.62
Analyzing	0.67 / 0.63	0.62	0.70	0.73
Concrete Processing	0.74 / 0.71	0.64	0.77	0.72
Regulation Strategy:				
Self-reg.: L. Proc &Results	0.75 / 0.73	0.74	0.77	0.75
Self-reg.: L. Content	0.78 / 0.73	0.68	0.72	0.73
External Reg.: L. Processes	0.67 / **0.48**	0.68	**0.46**	0.62
External Reg.: Learning Results	0.71 / 0.65	0.59	0.61	0.66
Lack of Regulation	0.68 / 0.72	0.61	0.66	0.60
Mental Model of Learning:				
Construction of Knowledge	0.77 / 0.78	0.74	0.78	0.71
Intake of Knowledge	0.78 / 0.77	0.53	0.60	0.63
Use of Knowledge	0.76 / 0.70	0.66	0.68	0.71
Stimulating Education	0.90 / 0.88	0.82	0.64	0.75
Cooperative Learning	0.93 / 0.89	0.67	0.83	0.73
Learning Orientation:				
Personally Interested	0.74 / 0.57	**0.22**	0.54	0.50
Certificate-oriented	0.81 / 0.76	0.62	**0.49**	0.69
Self-test-oriented	0.86 / 0.84	0.55	0.70	0.75
Vocation-oriented	0.85 / 0.69	**0.46**	0.73	0.79
Ambivalent	0.75 /0.82	0.64	0.77	0.65

Note for Vermunt (1998): OU – Open University, RU – Regular University

It is well known that unlike western students who relate memorization closely with rote learning, typical Asian (and in particular Chinese) students have a more complicated concept of memorization that may be associated with different forms of understanding, resulting in the so-called *Paradox of the Chinese Learner* (Marton *et al.*, 1996), a phenomenon which puzzled many western researchers in the past. This difference may explain the lower alpha value of *Memorizing and Rehearsing* in the present study. On the other hand, the higher alpha value of *Analyzing* in the present study may indicate that the targeted groups of Hong Kong students are more acquainted with stepwise analyzing as a processing strategy than their Dutch counterparts.

Similarly, the differences in regulative strategies may indicate that the students in the present study are more acquainted with *External Regulation* in the learning process, and less aware of the possible problem of *Lack of Regulation.* The differences in the scales for mental model of learning, in particular *Intake of Knowledge*, *Stimulating Education* and *Cooperative Learning,* may indicate that these students are less separated in their concepts of learning, especially in the roles of the teachers, the classmates and themselves. The students also appear to be less separated in their learning orientations. However, they are less aware of the possible problem of being *Ambivalent*, but are more *Vocation-oriented*, possibly reflecting the more employment-directed nature of the students in the local context, which appears to be similar to the OU students in Vermunt's study.

Finally, it is worth noting that the alpha value of *Personally Interested*, the scale with the lowest internal consistency in the present study, is in fact close to that reported in Vermunt's study for the RU students, suggesting the need for more investigation into this scale as a measure of personal interest of full-time students for study.

It is also worth commenting that most of the alpha values of the ILS scales in the present study are higher than the corresponding values reported in Ajisuksmo and

Vermunt (1999), especially those for *Analyzing*, *Intake of Knowledge*, *Personally Interested*, *Self-test-oriented* and *Vocation-oriented.* The alpha values are also comparable to those of Boyle *et al.* (2003), with a difference of 0.1 or more occurring in four scales: *External Regulation of Learning Processes*, *Stimulating Education*, *Cooperative Learning* and *Certificate-oriented*, favoring the present study in three of the cases. While all these results further confirm the reliabilities of the ILS scales in the present study, they also indicate possible response domains that warrant further attention in adapting the ILS to an Asian response context.

Before furthering analyses are presented, it should be noted that many reported surveys using the ILS as a research instrument have collected feedback on students' learning patterns and concepts with an unspecified timeframe for students' reflection. However, the study reported in Vermetten *et al.* (1999b) asked students to reflect on their experience specifically about the past semester, and the arrangement was modeled after by the present study. Alpha values of the scales reported in that study varied between 0.57 and 0.93 (p.229), which are comparable to those of the original study reported in Vermunt (1998). In view of this fact and the results of the present study, collecting ILS scores at the semester-specific level should be an effective arrangement for surveying students' learning patterns.

Further explorations were then undertaken to seek improvement in the alpha values of the ILS scales through manipulation of their constituent items. From the item-total correlation analyses, it was found that the alpha values of three scales could be slightly improved by the removal of one item. This was broadly confirmed by the further factoring of the three scales, as in each case two correlated factors for the scale were exhibited.

The alpha value of the *Certificate-oriented* can be improved from 0.69 to 0.71 by the removal of Item 55. Analysis of the item descriptions reveals that Item 55 is concerned with 'obtaining good academic results', whereas the rest of the items are concerned with 'passing the exam' and 'obtaining the certificate' which may be viewed as different from Item 55 by the students in the present study, and this is a likely explanation for the improvement in scale reliability after the removal of that item.

In similar vein the alpha value of *Intake of Knowledge* can be improved from 0.63 to 0.67 by the removal of Item 80. Analysis of the item descriptions reveals that Item 80 is concerned with 'student's memorization of learned content', whereas the rest items concern with 'teacher's instruction and guidance', which may be viewed as different from Item 80 by the students in the present study.

The alpha value of *Personally Interested* could be improved from 0.50 to 0.53 by the removal of Item 64. Analysis of the item descriptions reveals that Item 64 is concerned with 'study for entertainment', whereas the rest of the items are concerned with 'study for personal interest or self-substantiation' which may be viewed as different from Item 64 by the students in the present study.

However, since the improvements resulting from these manipulations were not substantial, the composition of the ILS scales was not revised in the present study in order to maintain direct comparability with other published studies. In view of the satisfactory reliability of scales, the subsequent analyses of the ILS scores collected in the present study were mainly conducted at the *scale* level (i.e. for the 20 scales).

4.2.2 Validity

The internal structure of the ILS scales was investigated using exploratory factor analysis at the scale level. Following Subsection 4.1.2, since correlations were expected among some of the extracted factors, common factor analysis instead of principal components analysis was selected as the statistical model for the investigation, and the eigenvalue-greater-than-one rule, scree plot and over-factoring method were considered in determining the number of factors to be extracted.

In the factor extraction phase, both the eigenvalue-greater-than-one rule and the scree plot suggested that four factors should be extracted, and these factors explain 65.2% of the total variance. In the factor rotation phase, the four factors were subject to oblique rotation, using *Maximum Likelihood* as the extraction method and *Oblimin with Kaiser Normalization* as the rotation method. After the rotation, all the loadings from the *pattern matrix* for a factor are reorganized for better presentation and for facilitation of factor interpretation, with loadings of an absolute value of 0.3 or more shown in bold type for easy reference. The corresponding loadings from the *structure matrix* are also included and are shown in parentheses for comparison, as indicated in Table 4.9. The results of the original study of the ILS for a regular university as reported in Vermunt (1998) and the results of the adaptation of the ILS as reported in Ajisuksmo and Vermunt (1999) are shown in Table 4.10 for comparison.

It can be seen that variation in the learning patterns of students found in the present study resembles more closely those of Ajisuksmo and Vermunt (1999) than those of Vermunt (1998), which is not surprising as the former was conducted in a context (i.e. Indonesia) arguably more similar to the local context (i.e. Hong Kong).

The first factor in the present study (which explains 32.01% of the total variance) is characterized by high loadings on all five processing strategies (with higher values for the ones relating to deep processing) and the two self-regulation strategies. It should be noted that there are no loadings from learning conceptions and learning orientations on this factor, and it resembles the first factor of Ajisuksmo and Vermunt (1999), with more effects from meaning-directed than reproductive-directed elements. Using terminology similar to that in Ajisuksmo and Vermunt (1999), the factor can be interpreted as an active meaning-directed learning pattern slightly mixed with reproductive-directed elements.

Table 4.9 Results of factor analysis on ILS scale scores

	Factor			
Scale	1	2	3	4
Processing Strategy:				
Relating and Structuring	**0.83** (0.85)	0.01 (0.16)	0.03 (0.05)	-0.07 (-0.41)
Critical Processing	**0.84** (0.82)	-0.02 (0.12)	0.11 (0.10)	0.04 (-0.31)
Memorizing and Rehearsing	**0.34** (0.56)	0.05 (0.28)	-0.02 (0.09)	**-0.52** (-0.68)
Analyzing	**0.62** (0.76)	-0.02 (0.20)	-0.02 (0.04)	**-0.36** (-0.60)
Concrete Processing	**0.60** (0.70)	0.23 (0.34)	-0.10 (0.00)	-0.17 (-0.48)
Regulation Strategy:				
Self-reg.: L. Proc. & Results	**0.75** (0.84)	0.12 (0.27)	-0.06 (0.02)	-0.19 (-0.52)
Self-reg.: L. Content	**0.74** (0.77)	0.01 (0.15)	0.02 (0.04)	-0.08 (-0.38)
External Reg.: L. Processes	0.17 (0.47)	0.06 (0.34)	-0.03 (0.12)	**-0.71** (-0.80)
External Reg. L. Results	0.20 (0.48)	0.11 (0.36)	-0.05 (0.10)	**-0.67** (-0.78)
Lack of Regulation	0.14 (0.29)	-0.07 (0.20)	**0.34** (0.39)	**-0.39** (-0.48)
Mental Model of Learning:				
Construction of Knowledge	0.20 (0.28)	**0.82** (0.77)	-0.12 (0.11)	0.09 (-0.26)
Intake of Knowledge	-0.21 (-0.04)	**0.57** (0.68)	0.20 (0.41)	-0.20 (-0.36)
Use of Knowledge	-0.08 (0.06)	**0.81** (0.80)	-0.06 (0.20)	-0.05 (-0.30)
Stimulating Education	0.07 (0.17)	**0.79** (0.78)	-0.01 (0.23)	0.03 (-0.28)
Cooperative Learning	0.06 (0.09)	**0.37** (0.43)	0.23 (0.33)	0.05 (-0.15)
Learning Orientation:				
Personally Interested	0.17 (0.21)	**0.55** (0.57)	0.08 (0.24)	0.09 (-0.19)
Certificate-oriented	-0.29 (-0.15)	**0.39** (0.52)	**0.30** (0.46)	-0.21 (-0.29)
Self-test-oriented	0.05 (0.16)	**0.59** (0.65)	0.10 (0.29)	-0.07 (-0.32)
Vocation-oriented	-0.22 (-0.03)	**0.68** (0.70)	-0.09 (0.16)	-0.23 (-0.37)
Ambivalent	0.02 (-0.00)	0.04 (0.26)	**0.80** (0.80)	0.06 (-0.10)
Eigenvalue	6.40	3.33	0.88	0.74
% of Variance	32.01	16.63	4.38	3.72
Correlation: Factor 1	1.00	0.15	0.01	-0.41
Factor 2		1.00	0.31	-0.36
Factor 3			1.00	-0.18
Factor 4				1.00

Note: Factor loadings ≥ 0.3 or ≤ -0.3 are highlighted in bold type

The second factor (which explains 16.63% of the total variance) is characterized by high and a few moderate loadings on all the scales of learning concepts, and on all the scales of learning orientations except *Ambivalent*. It should be noted that there are no loadings from processing strategies and regulation strategies on this factor. It resembles the third factor of Ajisuksmo and Vermunt (1999), and can be interpreted as a passive idealistic learning pattern.

Table 4.10 Factor loadings of ILS scales in Vermunt (1998) and Ajisuksmo & Vermunt (1999)

	Factor							
	1		2		3		4	
Scale	VRU	A&V	VRU	A&V	VRU	A&V	VRU	A&V
Processing Strategy:								
Relating and Structuring	.72	**.82**						
Critical Processing	.70	**.72**						
Memorizing and Rehearsing		**.58**	.73	**.41**				
Analyzing		**.78**	.76					
Concrete Processing	.65	**.74**					-.39	
Regulation Strategy:								
Self-reg.: L. Proc. & Results	.74	**.77**						
Self-reg.: L. Content	.72	**.68**						
External Reg.: L. Processes		**.47**	.73	**.59**				
External Reg. L. Results		**.61**	.54	**.36**				
Lack of Regulation					.74			**-.69**
Mental Model of Learning:								
Construction of Knowledge	.75	**.48**				**.55**		**.32**
Intake of Knowledge	-.36		.54	**.54**	.33	**.52**		
Use of Knowledge		**.26**				**.59**	-.74	**.28**
Stimulating Education					.73	**.62**		**-.31**
Cooperative Learning					.61	**.69**		
Learning Orientation:								
Personally Interested	.54			**.45**			.25	**.35**
Certificate-oriented	-.41		.40	**.67**			-.33	
Self-test-oriented				**.47**	.29	**.35**		
Vocation-oriented				**.37**		**.29**	-.80	**.46**
Ambivalent					.65			**-.67**
Eigenvalue	4.3	**5.5**	3.0	**2.6**	1.9	**1.4**	1.3	**1.3**
% of variance	21.3	**27.4**	15.2	**12.8**	9.6	**7.0**	6.4	**6.4**
Cumulative %	21.3	**27.4**	36.5	**40.3**	46.1	**47.2**	52.5	**53.7**

Note: VRU – Vermunt (1998), Regular University; A&V – Ajisuksmo & Vermunt (1999)
Factor loadings >-0.25 and <0.25 are omitted in those reports

The third factor in the present study (which explains 4.38% of the total variance) most resembles an undirected learning pattern (i.e. the forth factor in Ajisuksmo and Vermunt (1999) and the third factor in Vermunt (1998)), with high loading on *Ambivalent* and moderate loading on *Lack of Regulation.* Unlike the corresponding learning pattern in Vermunt (1998) which has relatively high loadings from *Stimulating Education* and *Cooperative Learning*, this factor has no salient loadings from these two scales, but a moderate loading from *Certificate-oriented*, indicating a pattern of variation emphasizing the certificate rather than the support from teachers and classmates.

The fourth factor (which explains 3.72% of the total variance) is interesting, as all its loadings are negative. Viewing only from the magnitude of its loadings (i.e. ignoring the negative signs), this factor closely resembles the reproductive-directed learning pattern (i.e. the second factor in Vermunt (1998)), which is characterized by moderate loadings on stepwise processing strategies and high loadings on external regulation strategies, with moderate effects from the *Lack of Regulation* scale. Like the first factor, there are no loadings from learning conceptions and learning orientations on this factor, which can be interpreted as an active reproductive-directed learning pattern slightly mixed with lack of regulation elements.

It should be noted that in the present study, there is a clear lack of integration between the group of the action components (i.e. the processing and regulation strategies) and the conception and motivation components (i.e. the mental models of learning and learning orientations). However, in view of the resemblance of its results with those of Ajisuksmo and Vermunt (1999), and the opinions from other researchers such as those stated in the following paragraph, there should be a high degree of confidence that the findings in the present study have satisfactorily confirmed the validity of the adapted

ILS scales for collecting feedback on the learning patterns from Chinese students:

> Cultural differences in pedagogical and educational practices may give rise to differences in learning pattern structures. Ajisuksmo & Vermunt (1999) studied the learning styles and self-regulation of learning of Indonesian university students. They had the ILS translated into the Indonesian language and used that version for their studies. A comparison of the factor structures of Dutch and Indonesian students showed, among other things, that Dutch students experience aspects of learning patterns as separate aspects that, for Indonesian students, can go well together. This resembles the results of a study of Marton *et al.* (1997) on learning conceptions of Chinese students. Marton *et al.* (1997) found that these students do not experience memorizing and understanding as opposite poles, as is often found among Western students, but as phenomena that are closely interwoven.
>
> (Vermunt and Vermetten, 2004:369-370)

4.2.3 Interim Discussion

It is clear that the reliability and validity of the ILS-portion of the instrument are satisfactory for its intended context of investigation. The alpha values of the adapted ILS scales range between 0.50 and 0.78. As a result, in the second-stage analyses of the present study, the author decided not to revise the scales in order to facilitate direct comparison with other similar studies, although item manipulations could slightly improve three of these values.

Four factors were identified from the factor analysis of the ILS scores. These factors can be interpreted as four learning patterns, namely an active meaning-directed learning pattern slightly mixed with reproductive-directed elements, a passive idealistic learning pattern, an undirected learning pattern emphasizing on certificate-orientation and an active reproductive-directed learning pattern slightly mixed with lack of regulation elements. These results resemble the relevant features of the factor structure reported in Ajisuksmo and Vermunt (1999) in the Indonesian context. As cultural differences in pedagogical and educational practices may be reflected in students' learning patterns, it is not surprising that the identified factor structure does not resemble that in Vermunt (1998). Overall, the present study has broadly confirmed the validity of the adapted ILS for application in the context of the post-secondary education in Hong Kong.

As mentioned in Subsection 4.1.3, the credibility of the adapted ILS scales can be further demonstrated through criterion validity and discriminant validity. Initial investigation along these directions is reported in Chapter 5.

The preceding chapter has attempted to answer the first research question by addressing the various issues concerning the validation of the adapted instrument for application in the new response context of post-secondary education in Hong Kong. This chapter attempts to answer the second and third research questions through the initial exploration for systematic relationships among the relevant observables in the personological and contextual domains that are of interest in the present study.

5.1 Preliminary Analyses

5.1.1 Distribution of Students by Different Categories

As mentioned in Section 3.3, the data collected for the present study comprised valid returns of the research instrument from 1,572 out of 2,515 students studying at six institutions, corresponding to an overall response rate of 62.5%. Before systematic relationships among the relevant constructs were explored, crosstabulations were conducted as preliminary analyses of the frequency distribution of the collected data, based on general contextual observables such as *institution*, *programme type* and *subject area* studied by the students, and general personological observables such as the students' demographic background which was operationalized by their *age*, *gender* and *prior qualification*. The contingency tables resulting from some of these analyses are presented as Table 5.1 to Table 5.5.

It should be noted at this juncture that the number of cases in the analysis results reported below may sometimes be slightly less than 1,572, this being due to the automatic removal of cases with missing values by the SPSS system.

Table 5.1 shows the distribution of the participating students by their institutions and gender. It can be seen that although the gender distribution was unbalance for some institutions (e.g. Institution A and Institution F), the overall gender distribution in the sample data was generally balanced, with 54.9% being male students, and 45.1% being female students.

Table 5.1 Distribution of students by institution and by gender

Institution		Gender		Total
		Male	Female	
A		86	25	111
	% within Institution	77.5%	22.5%	100.0%
	% within Gender	10.0%	3.5%	7.1%
B		328	357	685
	% within Institution	47.9%	52.1%	100.0%
	% within Gender	38.1%	50.4%	43.6%
C		125	92	217
	% within Institution	57.6%	42.4%	100.0%
	% within Gender	14.5%	13.0%	13.8%
D		76	95	171
	% within Institution	44.4%	55.6%	100.0%
	% within Gender	8.8%	13.4%	10.9%
E		82	84	166
	% within Institution	49.4%	50.6%	100.0%
	% within Gender	9.5%	11.9%	10.6%
F		165	55	220
	% within Institution	75.0%	25.0%	100.0%
	% within Gender	19.1%	7.8%	14.0%
Total		862	708	1570
	% within Institution	54.9%	45.1%	100.0%
	% within Gender	100.0%	100.0%	100.0%

Table 5.2 shows the distribution of the participating students by their age and gender. To an acceptable extent, gender distribution was balanced in each of the lower five age groups, from *age of 18 or below* to *age of 22*; and these five groups contained most of the students (91.4%).

Table 5.2 Distribution of students by age and by gender				
		Gender		
Age		Male	Female	Total
≤18		363	281	644
	% within Age	56.4%	43.6%	100.0%
	% within Gender	42.2%	39.8%	41.1%
19		159	124	283
	% within Age	56.2%	43.8%	100.0%
	% within Gender	18.5%	17.6%	18.1%
20		101	93	194
	% within Age	52.1%	47.9%	100.0%
	% within Gender	11.7%	13.2%	12.4%
21		98	85	183
	% within Age	53.6%	46.4%	100.0%
	% within Gender	11.4%	12.0%	11.7%
22		63	64	127
	% within Age	49.6%	50.4%	100.0%
	% within Gender	7.3%	9.1%	8.1%
23		42	20	62
	% within Age	67.7%	32.3%	100.0%
	% within Gender	4.9%	2.8%	4.0%
24		16	9	25
	% within Age	64.0%	36.0%	100.0%
	% within Gender	1.9%	1.3%	1.6%
≥25		19	30	49
	% within Age	38.8%	61.2%	100.0%
	% within Gender	2.2%	4.2%	3.1%
Total		861	706	1567
	% within Age	54.9%	45.1%	100.0%
	% within Gender	100.0%	100.0%	100.0%

Table 5.3 shows the distribution of the participating students by the types and subject areas of their programmes. It can be seen that the majority of students were pursuing programmes with *Business* and *Hospitality/Tourism* as subject areas, and the majority types of programmes are *Project Yi Jin* as well as *Associate Degree and Higher Diploma*.

Table 5.3 Distribution of students by programme type and by subject area							
Programme Type	Subject Area						Total
	BABS	HOTO	LANG	IT	SOCSC	Other Area	
PYJ	103	219	15	142	42	30	551
PT%	18.7%	39.7%	2.7%	25.8%	7.6%	5.4%	100.0%
SA%	19.2%	41.3%	16.9%	52.6%	38.2%	83.3%	35.1%
CDFD	125	257	0	1	15	0	398
PT%	31.4%	64.6%	0.0%	0.3%	3.8%	0.0%	100.0%
SA%	23.3%	48.5%	0.0%	0.4%	13.6%	0.0%	25.3%
ADHD	273	54	74	96	53	0	550
PT%	49.6%	9.8%	13.5%	17.5%	9.6%	0.0%	100.0%
SA%	50.8%	10.2%	83.1%	35.6%	48.2%	0.0%	35.0%
TUBD	36	0	0	31	0	0	67
PT%	53.7%	0.0%	0.0%	46.3%	0.0%	0.0%	100.0%
SA%	6.7%	0.0%	0.0%	11.5%	0.0%	0.0%	4.3%
Other Type	0	0	0	0	0	6	6
PT%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
SA%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%	0.4%
Total	537	530	89	269	110	36	1572
PT%	34.2%	33.7%	5.7%	17.2%	7.0%	2.3%	100.0%
SA%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Programme type: PYJ - Project Yi Jin; CDFD - Certificate, Diploma and Foundation Diploma; ADHD - Associate Degree and Higher Diploma; TUBD - Top-up Bachelor's Degree
Subject area: BABS - Business Administration/Business Studies; HOTO- Hospitality /Tourism; LANG - Language Studies; IT - Information Technology; SOCSC - Social Science
PT% - % within Programme Type; SA% - % within Subject Area

Table 5.4 shows the distribution of the participating students by their prior qualifications and the types of their programmes. It should be noted that in the present study, a student's prior qualification is operationalized as the number of subjects passed in the Hong Kong Certificate of Education Examination (HKCEE), the public examination in Hong Kong for students after completion of Secondary 5. It can be seen that the majority of students pursuing programmes of *Project Yi Jin* as well as *Certificate, Diploma and Foundation Diploma* were of lower prior qualifications in their secondary education (i.e. 0 or 1 pass in the HKCEE), and the majority of students pursuing programmes of *Top-up Bachelor's Degree* as well as *Associate Degree and Higher Diploma* were of higher prior qualifications in their secondary education (i.e. 5 or more passes in the HKCEE).

Table 5.4 Distribution of students by prior qualification and by programme type							
Programme Type	Prior Qualification (No. of Subject Passes in the HKCEE)						Total
	≤1	2	3	4	≥5	N/A	
PYJ	216	111	88	62	48	18	543
PT%	39.8%	20.4%	16.2%	11.4%	8.8%	3.3%	100.0%
PQ%	62.4%	51.2%	40.4%	31.6%	8.7%	69.2%	35.0%
CDFD	108	76	73	47	86	1	391
PT%	27.6%	19.4%	18.7%	12.0%	22.0%	0.3%	100.0%
PQ%	31.2%	35.0%	33.5%	24.0%	15.7%	3.8%	25.2%
ADHD	21	29	53	79	358	7	547
PT%	3.8%	5.3%	9.7%	14.4%	65.4%	1.3%	100.0%
PQ%	6.1%	13.4%	24.3%	40.3%	65.2%	26.9%	35.2%
TUBD	1	1	4	8	51	0	65
PT%	1.5%	1.5%	6.2%	12.3%	78.5%	0.0%	100.0%
PQ%	0.3%	0.5%	1.8%	4.1%	9.3%	0.0%	4.2%
Other Type	0	0	0	0	6	0	6
PT%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
PQ%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.4%
Total	346	217	218	196	549	26	1552
PT%	22.3%	14.0%	14.0%	12.6%	35.4%	1.7%	100.0%
PQ%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Programme type: PYJ - Project Yi Jin; CDFD - Certificate, Diploma and Foundation Diploma; ADHD - Associate Degree and Higher Diploma; TUBD - Top-up Bachelor's Degree
PT% - % within Programme Type; PQ% - % within Prior Qualification
Note: For prior education, N/A indicates that the HKCEE had not been attempted

Table 5.5 shows the distribution of the participating students by their gender and the subject areas of their programmes. It can be seen that gender distribution was generally balanced for the subject areas of *Business*, *Hospitality/Tourism* and *Social Science*, but was unbalanced for the subject areas of *Language Studies* and *Information Technology*.

Table 5.5 Distribution of students by gender and by subject area			
	Gender		
Subject Area	Male	Female	Total
BABS	236	300	536
% within Subject Area	44.0%	56.0%	100.0%
% within Gender	27.4%	42.4%	34.1%
HOTO	282	248	530
% within Subject Area	53.2%	46.8%	100.0%
% within Gender	32.7%	35.0%	33.8%
LANG	29	60	89
% within Subject Area	32.6%	67.4%	100.0%
% within Gender	3.4%	8.5%	5.7%
IT	233	37	270
% within Subject Area	86.3%	13.7%	100.0%
% within Gender	27.0%	5.2%	17.2%
SOCSC	61	49	110
% within Subject Area	55.5%	44.5%	100.0%
% within Gender	7.1%	6.9%	7.0%
Other Area	21	14	35
% within Subject Area	60.0%	40.0%	100.0%
% within Gender	2.4%	2.0%	2.2%
Total	862	708	1570
% within Subject Area	54.9%	45.1%	100.0%
% within Gender	100.0%	100.0%	100.0%

Subject area: BABS - Business Administration/Business Studies; HOTO- Hospitality /Tourism; LANG - Language Studies; IT - Information Technology; SOCSC - Social Science

5.1.2 Analyses of CEQ Scale Scores by Institution, Programme Type and Subject Area

A question for the present study was whether students from different institutions had different perceptions of the learning context, as operationalized by the revised CEQ scales. Basic statistics in terms of the means and standard derivations of the revised CEQ scale scores from the respective institutions are shown in Table 5.6.

Table 5.6 Means and standard derivations (in parenthesis) of the revised CEQ scale scores by institution

Revised CEQ Scale	Institution A (n = 111)	B (n = 686)	C (n = 217)	D (n = 71)	E (n= 166)	F (n = 221)	Overall (n = 1572)
Good Teaching	3.17 (0.57)	3.23 (0.59)	3.14 (0.57)	3.24 (0.51)	3.22 (0.58)	3.22 (0.62)	3.22 (0.58)
Appropriate Workload	2.87 (0.66)	2.89 (0.68)	3.01 (0.68)	2.98 (0.66)	3.10 (0.74)	2.99 (0.70)	2.95 (0.69)
Appropriate Assessment	2.93 (0.61)	2.86 (0.55)	2.88 (0.58)	2.91 (0.57)	2.83 (0.55)	2.86 (0.56)	2.87 (0.56)
Emphasis on Independence	3.18 (0.66)	3.03 (0.65)	3.13 (0.67)	3.08 (0.62)	3.12 (0.65)	3.13 (0.75)	3.09 (0.67)
Generic Skills	3.20 (0.60)	3.41 (0.60)	3.21 (0.66)	3.25 (0.63)	3.30 (0.66)	3.28 (0.67)	3.32 (0.63)

A multivariate analysis of variance (MANOVA) was carried out on the revised CEQ scale scores, using *institution* as the factor for within/between-group comparisons. The four multivariate statistics reported by SPSS and their values, the corresponding F-ratios and their significance values, as well as the eta-squared as a measure of effect size are summarized in Table 5.7. Since the present study involved a large number of tests of statistical significance, the more stringent **threshold possibility level (i.e. p-value) of 0.01** was adopted in order to reduce the likelihood of making Type I errors (i.e. obtaining spuriously significant results), with F-ratios which were statistically significant (i.e. those with p-values less than 0.01) being highlighted in bold type for easy reference. From Table 5.7, it can be seen that all the four multivariate statistics are statistically significant at the $p<0.0005$ level. There are thus overall differences in the revised CEQ scale scores attributable to institution, and these statistics justify a closer examination of the differences via one-way analysis of variance (ANOVA). However, it should be noted that the proportion of variance in the CEQ values being explained by institution, as estimated by the eta-squared of the multivariate statistics, is small and ranges between 1.4% and 5.0%.

Table 5.7 Results of conducting MANOVA on the revised CEQ scale scores using institution as factor				
Multivariate Statistics	Value	F	Significance	Eta-squared
Pillai's Trace	0.070	**4.478**	<0.0005	0.014
Wilks' Lambda	0.931	**4.539**	<0.0005	0.014
Hotelling's Trace	0.073	**4.582**	<0.0005	0.014
Roy's Largest Root	0.053	**16.583**	<0.0005	0.050

To follow up the MANOVA, an exploratory ANOVA was thus conducted on each of the revised CEQ scale scores, using *institution* as the factor for within/between-group comparisons. The results, in terms of the F-ratios, their significance values and the eta-squared, are shown in Table 5.8.

Table 5.8 Results of conducting ANOVAs on the revised CEQ scale scores using institution as factor			
Revised CEQ Scale	F (5, 1566)	Significance	Eta-squared
Good Teaching	1.379	0.229	0.004
Appropriate Workload	**3.398**	0.005	0.011
Appropriate Assessment	0.760	0.578	0.002
Emphasis on Independence	1.811	0.108	0.006
Generic Skills	**5.998**	<0.0005	0.019

It was found that differences in students' perceptions were not statistically significant for *Good Teaching*, *Appropriate Assessment* and *Emphasis on Independence*, but were statistically significant for *Generic Skills* at the $p < 0.0005$ level, and for *Appropriate Workload* at the $p \leq 0.005$ level. The proportion of variance in the respective CEQ scale scores being explained by institution, as estimated by the eta-squared, is small and ranges between 0.2% and 1.9%.

The above results may cast doubt on the *discriminant validity* of the revised CEQ for the intended context of the present study, as the difference between the various institutions on the most telling indicator of students' perceptions, i.e. *Good Teaching*, was not statistically significant. A plausible explanation is that the six participating institutions are governed by the same sponsoring body (i.e. Caritas – Hong Kong) and share the same mission, and therefore a similar educational environment is provided to students at the institutional level. However, differences in students' perceptions may be revealed in various programme types and subject areas.

Further MANOVAs and ANOVAs were therefore conducted on the revised CEQ scale scores, using *programme type* and *subject area* respectively as the factor for within/between-group comparisons. In these analyses, cases with an unspecified programme type or an unspecified subject area were ignored, reducing the number of cases for investigation from 1,572 to 1,536.

The results of MANOVA using *programme type* as the factor are shown in Table 5.9. It can be seen that all the four multivariate statistics are statistically significant at the $p < 0.0005$ level. The proportion of variance in the CEQ values being explained by programme type, as estimated by the eta-squared of the multivariate statistics, is small and ranges between 2.4% and 6.6%.

Table 5.9 Results of conducting MANOVA on the revised CEQ scale scores using programme type as factor

Multivariate Statistics	Value	F	Significance	Eta-squared
Pillai's Trace	0.073	**7.624**	<0.0005	0.024
Wilks' Lambda	0.928	**7.766**	<0.0005	0.025
Hotelling's Trace	0.078	**7.895**	<0.0005	0.025
Roy's Largest Root	0.070	**21.495**	<0.0005	0.066

Further exploratory one-way ANOVA analyses were conducted on the revised CEQ scale scores, using *programme type* as the factor for within/between-group comparisons. The results of the analyses are shown in Table 5.10.

Table 5.10 Results of conducting ANOVAs on the revised CEQ scale scores using programme type as factor

Revised CEQ Scale	F (3, 1532)	Significance	Eta-squared
Good Teaching	1.452	0.226	0.003
Appropriate Workload	**4.442**	0.004	0.009
Appropriate Assessment	0.245	0.865	<0.0005
Emphasis on Independence	2.979	0.030	0.006
Generic Skills	**14.454**	<0.0005	0.028

For the comparisons based on *programme type*, it was found that the differences in students' perceptions were not statistically significant for *Good Teaching*, *Appropriate Assessment* and *Emphasis on Independence,* but were statistically significant for *Generic Skills* at the $p < 0.0005$ level, and for *Appropriate Workload* at the $p \leq 0.004$ level. The proportion of variance in the respective CEQ scale scores being explained by programme type, as estimated by the eta-squared, is small and ranges between 0.05% and 2.8%.

Further investigation into the teaching and learning arrangements of the participating institutions revealed that for each major subject area, different types of programme were in fact taught by the same group of teachers, which may plausibly explain the above results, i.e. differences in students' perceptions among various programme types were not found in more-teacher-dependent features like *Good Teaching*, but found in more-programme-dependent features like *Generic Skills*.

The results of MANOVA using *subject area* as the factor are shown in Table 5.11. It can be seen that all the four multivariate statistics are statistically significant at the $p < 0.0005$ level. The proportion of variance in the CEQ values being explained by subject area, as estimated by the eta-squared of the multivariate statistics, is small and ranges between 2.3% and 5.4%.

Table 5.11 Results of conducting MANOVA on the revised CEQ scale scores using subject area as factor

Multivariate Statistics	Value	F	Significance	Eta-squared
Pillai's Trace	0.091	**7.157**	<0.0005	0.023
Wilks' Lambda	0.911	**7.226**	<0.0005	0.023
Hotelling's Trace	0.095	**7.265**	<0.0005	0.023
Roy's Largest Root	0.057	**17.573**	<0.0005	0.054

Further exploratory one-way ANOVA analyses were conducted on the revised CEQ scale scores, using *subject area* as the factor for within/between-group comparisons. The results of the analyses are shown in Table 5.12.

Table 5.12 Results of conducting ANOVAs on the revised CEQ scale scores using subject area as factor

Revised CEQ Scale	F (3, 1532)	Significance	Eta-squared
Good Teaching	**9.500**	<0.0005	0.024
Appropriate Workload	**5.294**	<0.0005	0.014
Appropriate Assessment	**6.685**	<0.0005	0.017
Emphasis on Independence	**7.839**	<0.0005	0.020
Generic Skills	**7.630**	<0.0005	0.020

For the comparisons based on *subject area*, it was found that difference in students' perceptions was statistically significant for all the revised CEQ scales at the $p < 0.0005$ level. The proportion of variance in the respective CEQ scale scores being explained by subject area, as estimated by the eta-squared, is small and ranges between 1.4% and

2.4%.

In summary, the present findings constitute initial evidence for arguing that students pursuing programmes at *different institutions*, of different *programme types,* and especially for different *subject areas* may have different perceptions on their learning context; the revised CEQ is able to largely capture these differences and therefore to a certain extent its discriminant validity is confirmed. However, it should be noted that the effect sizes of these differences as found in the present study were all small or negligible, in the light of the rules of thumb given in Cohen (1992:157), whereby the values of 0.1, 0.3 and 0.5 correspond to 'small', 'moderate' and 'large' effect sizes respectively for the strength of an association (measured by statistics such as the correlation coefficient r[18]).

5.1.3 Analyses of ILS Scale Scores by Institution, Programme Type and Subject Area

Basic statistics in terms of the means and standard derivations of the ILS scale scores from the respective institutions are shown in Table 5.13.

The results of conducting MANOVA on the ILS scale scores using *institution* as the factor for within/between-group comparisons are shown in Table 5.14. It can be seen that all the four multivariate statistics are statistically significant at the $p < 0.0005$ level. The proportion of variance in the ILS values being explained by institution, as estimated by the eta-squared of the multivariate statistics, is small to moderate and ranges between

[18] As eta-squared is conceptually similar to r^2 (Bryman and Cramer, 2005/2006:228), a value of 0.01, 0.09 and 0.25 is considered as representing a 'small', 'moderate' and 'large' effect size respectively in the present study.

4.3% and 12.8%.

Table 5.13 Means and standard derivations (in parenthesis) of the ILS scale scores by institution

ILS Scale	Institution						Overall
	A (n = 111)	B (n = 686)	C (n = 217)	D (n = 171)	E (n= 166)	F (n = 221)	(n = 1572)
Processing Strategy:							
Relating and Structuring	2.54 (0.57)	2.46 (0.64)	2.47 (0.65)	2.49 (0.70)	2.30 (0.69)	2.34 (0.73)	2.44 (0.67)
Critical Processing	2.58 (0.68)	2.38 (0.70)	2.42 (0.75)	2.46 (0.71)	2.21 (0.75)	2.35 (0.84)	2.38 (0.74)
Memorizing and Rehearsing	2.65 (0.56)	2.82 (0.60)	2.66 (0.66)	2.78 (0.61)	2.66 (0.66)	2.50 (0.69)	2.72 (0.64)
Analyzing	2.58 (0.65)	2.51 (0.58)	2.49 (0.69)	2.56 (0.62)	2.48 (0.68)	2.31 (0.68)	2.49 (0.64)
Concrete Processing	2.82 (0.59)	2.85 (0.66)	2.64 (0.64)	2.75 (0.68)	2.69 (0.73)	2.70 (0.73)	2.77 (0.68)
Regulation Strategy:							
Self-reg.: L. Proc. & Results	2.69 (0.60)	2.62 (0.62)	2.58 (0.69)	2.60 (0.63)	2.49 (0.68)	2.50 (0.76)	2.59 (0.66)
Self-reg.: L. Content	2.58 (0.64)	2.45 (0.74)	2.50 (0.79)	2.53 (0.75)	2.30 (0.71)	2.31 (0.80)	2.44 (0.75)
External Reg.: L. Processes	2.61 (0.57)	2.78 (0.57)	2.65 (0.62)	2.77 (0.62)	2.69 (0.61)	2.54 (0.67)	2.71 (0.61)
External Reg.: L. Results	2.81 (0.56)	2.97 (0.61)	2.61 (0.65)	2.84 (0.63)	2.78 (0.68)	2.62 (0.65)	2.82 (0.64)
Lack of Regulation	2.75 (0.61)	2.83 (0.61)	2.71 (0.65)	2.81 (0.60)	2.73 (0.67)	2.73 (0.71)	2.78 (0.64)
Mental Model of Learning:							
Construction of Knowledge	3.22 (0.64)	3.45 (0.59)	3.13 (0.62)	3.20 (0.60)	3.25 (0.66)	3.20 (0.66)	3.31 (0.63)
Intake of Knowledge	3.20 (0.60)	3.40 (0.62)	3.23 (0.66)	3.40 (0.56)	3.32 (0.69)	3.33 (0.67)	3.34 (0.64)
Use of Knowledge	3.35 (0.65)	3.60 (0.62)	3.31 (0.70)	3.46 (0.67)	3.51 (0.74)	3.49 (0.72)	3.50 (0.67)
Stimulating Environment	3.25 (0.64)	3.45 (0.62)	3.19 (0.66)	3.29 (0.63)	3.34 (0.68)	3.32 (0.73)	3.35 (0.65)
Cooperative Learning	3.10 (0.70)	3.03 (0.73)	3.11 (0.71)	3.10 (0.65)	2.95 (0.74)	3.07 (0.83)	3.05 (0.73)
Learning Orientation:							
Personally Interested	3.11 (0.69)	3.20 (0.55)	3.16 (0.61)	3.14 (0.56)	3.21 (0.64)	3.24 (0.66)	3.19 (0.59)
Certificate-oriented	3.36 (0.75)	3.46 (0.71)	3.36 (0.80)	3.48 (0.71)	3.51 (0.75)	3.51 (0.82)	3.45 (0.75)
Self-test-oriented	3.23 (0.73)	3.39 (0.70)	3.18 (0.74)	3.29 (0.74)	3.24 (0.81)	3.16 (0.74)	3.29 (0.74)
Vocation-oriented	3.46 (0.74)	3.85 (0.69)	3.45 (0.81)	3.63 (0.78)	3.71 (0.77)	3.66 (0.78)	3.70 (0.76)
Ambivalent	3.06 (0.64)	2.97 (0.70)	3.01 (0.63)	3.04 (0.61)	2.93 (0.73)	3.00 (0.69)	2.99 (0.68)

Table 5.14 Results of conducting MANOVA on the ILS scale scores using institution as factor				
Multivariate Statistics	Value	F	Significance	Eta-squared
Pillai's Trace	0.214	**3.459**	<0.0005	0.043
Wilks' Lambda	0.799	**3.545**	<0.0005	0.044
Hotelling's Trace	0.235	**3.632**	<0.0005	0.045
Roy's Largest Root	0.147	**11.433**	<0.0005	0.128

Further exploratory one-way ANOVA analyses were conducted on the ILS scale scores, using *institution* as the factor. The results of the analyses are shown in Table A of Appendix VI; it was found that the differences in 14 of the 20 scale scores were statistically significant at the 0.01 level, except for *Ambivalent*, *Certificate-oriented, Cooperative Learning*, *Lack of Regulation*, *Personally Interested* and *Self-regulation of Learning Processes and Results.*

The results of conducting MANOVA on the ILS scale scores using *programme type* as the factor for within/between-group comparisons are shown in Table 5.15. It can be seen that all the four multivariate statistics are statistically significant at the $p < 0.0005$ level. The proportion of variance in the ILS values being explained by programme type, as estimated by the eta-squared of the multivariate statistics, is small to moderate and ranges between 6.3% and 14.5%.

Table 5.15 Results of conducting MANOVA on the ILS scale scores using programme type as factor				
Multivariate Statistics	Value	F	Significance	Eta-squared
Pillai's Trace	0.190	**5.120**	<0.0005	0.063
Wilks' Lambda	0.817	**5.278**	<0.0005	0.065
Hotelling's Trace	0.216	**5.440**	<0.0005	0.067
Roy's Largest Root	0.170	**12.890**	<0.0005	0.145

Further exploratory one-way ANOVA analyses were conducted on the ILS scale scores, using *programme type* as the factor. The results of the analyses are shown in Table B of Appendix VI; it was found that the differences in 12 of the 20 scale scores were statistically significant at the 0.01 level, except for *Ambivalent*, *Analyzing*, *Certificate-oriented*, *Cooperative Learning*, *Critical Processing*, *Personally Interested*, *Relating and Structuring* and *Self-regulation of Learning Processes and Results*.

The results of conducting MANOVA on the ILS scale scores using *subject area* as the factor for within/between-group comparisons are shown in Table 5.16. It can be seen that all the four multivariate statistics are statistically significant at the $p < 0.0005$ level. The proportion of variance in the ILS values being explained by subject area, as estimated by the eta-squared of the multivariate statistics, is small and ranges between 4.9% and 8.6%.

Table 5.16 Results of conducting MANOVA on the ILS scale scores using subject area as factor

Multivariate Statistics	Value	F	Significance	Eta-squared
Pillai's Trace	0.195	**3.880**	<0.0005	0.049
Wilks' Lambda	0.818	**3.903**	<0.0005	0.049
Hotelling's Trace	0.208	**3.924**	<0.0005	0.049
Roy's Largest Root	0.094	**7.152**	<0.0005	0.086

Further exploratory one-way ANOVA analyses were conducted on the ILS scale scores, using *subject area* as the factor. The results of the analyses are shown in Table C of Appendix VI; it was found that the differences in 16 of the 20 scale scores were statistically significant at the 0.01 level, except for *Ambivalent*, *Certificate-oriented*, *Intake of Knowledge* and *Self-test-oriented*.

In summary, the present findings constitute initial evidence for arguing that students pursuing programmes at *different institutions*, of different *programme types*, and for different *subject areas* may have different learning patterns; the ILS is able to largely capture these differences and therefore to a certain extent its discriminant validity is confirmed. However, it should be noted again that the effect sizes of these differences as found in the present study are mostly small.

5.1.4 Interim Discussion

The preliminary analyses reported above aim to shed light on the distribution of the sample data for the present study, from classifications of data based on some contextual and personological observables. Through MANOVA and ANOVA, the possible effects of some general contextual observables, such as *institution*, *programme type* and *subject area*, on students' learning patterns and their perceptions of the learning context were explored. At this juncture, it should be acknowledged that as the students concerned were exposed to different kinds of learning environment, analyses conducted in the present study were in fact simplistic and not based on rigorous data modeling, such as hierarchical linear models (c.f., Kennedy and Mandeville, 2000). Nevertheless, it is still worthwhile to conduct further analyses on the sample data to explore the possible systematic relationships among the relevant observables that are of interest in the present research, and compare the results with other published work. These results were reported in Sections 5.2 and 5.3 below, with their relative importance being assessed from two perspectives: *statistical significance* and *effect size*.

5.2 Exploration for Systematic Relationships Based on Tests of Statistical Significance

5.2.1 General Theoretical Model on Relationships among Relevant Constructs of Student Learning

As mentioned in Section 3.6.4, despite the well-known limitation of correlational studies to posit causal inference, an investigation is still able to make more explicit the possible causal links among the constructs of interest, by focusing on just a few constructs at one time and using tests of statistical significance (and changes in magnitude) of standardized regression coefficients to infer the direct effects, indirect effects and/or spurious effects among these constructs. Such an approach was proposed in Richardson (2006) to investigate the relationships among students' demographic background, perceptions, study behaviors and outcome measures, and in Richardson (2007) to investigate the relationships among students' demographic background, motives and attitudes, study behaviors and outcome measures. These two studies were conducted on students in the UK higher education sector for distance learning, while a similar approach was adopted in the present study to analyze students in the post-secondary sector of Hong Kong for regular learning.

In this part of the study, the author was interested in exploring the systematic relationships among the following four components:

- Students' demographic background operationalized by their age, gender and prior qualification;

- Students' perceptions of the learning context operationalized by their scores on the revised CEQ scales;

- Students' learning patterns operationalized by their scores on the ILS scales; and

- Outcome measures of learning operationalized by students' satisfaction with and expected performance in the programme.

The exploration was based on the general theoretical model depicted in Figure 5.1. As suggested by Richardson, the model serves to make explicit a number of possible causal links as follows:

- In principle, students' demographic background may have a direct effect upon their perceptions (Path A), but also an indirect effect that is mediated by concomitant variations in their learning patterns (Path B → C).

- Similarly, students' demographic background may have a direct effect upon their learning patterns (Path B), but also an indirect effect that is mediated by concomitant variations in their perceptions (Path A → D).

- Students' perceptions may have a direct effect upon outcome measures (Path E), but also an indirect effect that is mediated by concomitant variations in their learning patterns (Path D → F).

- Similarly, students' learning patterns may have a direct effect upon outcome measures (Path F), but also an indirect effect that is mediated by concomitant variations in their perceptions (Path C → E).

- Finally, the students' demographic background may have a direct effect upon outcome measures (Path G), but also indirect effects that are mediated by variations in their perceptions (Path A → E) or by variations in their learning patterns (Path B → F).

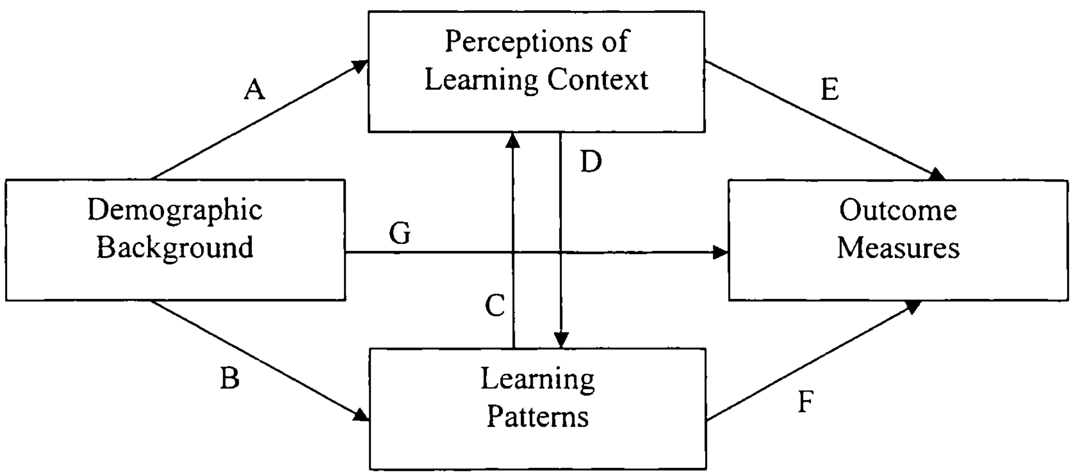

Figure 5.1 A General Theoretical Model of Relationships among Students' Demographic Background, Perceptions, Learning Patterns and Outcome Measures

The hypothesized patterns of causal relationships among the observables of the model can be investigated by means of *path analysis* based on multiple regression analyses. For example, the relationship between students' demographic background and students' perceptions may comprise both direct effect (Path A) and indirect effect (Path B → C). However, the regression of students' perceptions on both their demographic background and their learning patterns can identify the contribution of these two components as follows:

- A *direct effect* of students' demographic background upon students' perceptions is implied by standardized regression coefficients (i.e. beta weights) from multiple regression analyses that are statistically significant even when variations in learning patterns are controlled. These findings provide evidence that variations in demographic background give rise to variations in perceptions (Path A).

- An *indirect effect* of students' demographic background upon students' perceptions is implied by standardized regression coefficients that are significant when variations in learning patterns are not controlled but that are attenuated, eliminated or even reversed when variations in learning patterns are controlled. These findings provide evidence that variations in demographic background give rise to variations in learning patterns (Path B) and that variations in learning patterns in turn give rise to variations in perceptions (Path C).

As another example, the relationship between students' perceptions and outcome measures may contain direct effect (Path E) and indirect effect (Path D $\rightarrow$ F). The relationship may also be a spurious effect with students' demographic background being a common cause for the variations in students' perceptions and outcome measures (directly through Path A and Path G, or indirectly through Path B $\rightarrow$ C and Path B $\rightarrow$ F). However, the regression of outcome measures on students' demographic background, their perceptions and their learning patterns can identify the contribution of these three components as follows:

- A direct effect of students' perceptions on outcome measures is implied by standardized regression coefficients that are statistically significant even when variations in both demographic background and learning patterns are controlled.

These findings provide evidence that variations in students' perceptions give rise to variations in outcome measures (Path E).

- An indirect effect of students' perceptions on outcome measures is supported by standardized regression coefficients that are significant when only variations in demographic background are controlled but that are attenuated, eliminated or even reversed when variations in both demographic background and learning patterns are controlled. These findings provide evident that variations in students' perceptions give rise to variations in their learning patterns (Path D) and that variations in their learning patterns in turn give rise to variations in outcome measures (Path F).

- A *spurious effect* is implied by standardized regression coefficients that are significant when variations in demographic background and learning patterns are not controlled, but are attenuated, eliminated or even reversed when only variations in demographic background are controlled. These findings provide evidence that variations in students' demographic background are simply the common cause of variations in students' perceptions (Path A and/or Path B → C) and variations in outcome measures (Path G and/or Path B → F).

As mentioned in Richardson (2007:390), Figure 5.1 is not a conventional structural model for path analysis based on structural equation modeling (SEM) techniques, e.g. see Chapter 12 of Cohen *et al.* (2003), but is aimed to provide a parsimonious approach to analyze the possible causal relationships among a relatively large group of observables, where the application of SEM techniques is considered impractical. It should be noted that unlike the conventional model, a box in Figure 5.1 does not represent an individual observable, but a set of observables (e.g., the box demographic background comprises three observables, i.e. the student's age, gender and prior qualification). A link does not represent the actual relationship between two observables, but the possible relationships between two sets of observables. Moreover, the model is non-recursive in that it includes links that are (potentially) reciprocal rather than unidirectional (i.e. Path C and Path D), thus violating an assumption of SEM-based path analysis.

Path analysis based on multiple regression techniques as described above, instead of the SEM-based approach, was therefore employed to analyze the relationships among the constructs included in the model. As suggested in Richardson (2006:872-873), this kind of path analysis constitutes a genuinely exploratory approach to identify the possible relationships among the relevant observables, as the existence and direction of causal links are resolved by reference to statistical criteria, rather than a priori assumptions.

In both Richardson (2006) and Richardson (2007), spurious effect is illustrated as merely the effects of the common cause directly exercised via Path A and Path G. However, it is also possible for the effects of the common cause to be exercised indirectly, via Path B $\rightarrow$ C and Path B $\rightarrow$ F as mentioned above. In fact, such situations were encountered in the present study when the relationships of the ILS components were explored, as reported in Section 5.2.13.

The author also agreed with Richardson in his responses to the following two possible criticisms of the above regression-based techniques:

- *The magnitude of standardized regression coefficients depends on the exact combination of predictor variables being used.* Richardson argued that it is precisely this characteristic of the coefficients that is exploited by the regression-based path analysis to illuminate how the apparent effects of one predictor variable may actually mediated by its relationship with other predictor variables.

- *Standardized regression coefficients can be rendered unstable due to correlations among the predictor variables (i.e. collinearity).* Richardson pointed out that this should not be a problem for sufficiently large sample (e.g. the number of cases in the sample being at least 40 times the number of predictor variables, a guideline which is satisfied in the present study).

Since the ensuing analyses involved a large number of tests of statistical significance, the more stringent threshold possibility level of 0.01 was again followed in order to reduce the likelihood of making Type I errors, as also suggested by Richardson. However, for completeness of presentation, the typical practice of reporting statistical significance at the 0.5, 0.01 and 0.001 levels was still adopted, with standardized regression coefficients which were statistically significant (i.e. those with p-values less than 0.01) being highlighted in bold type for easy reference. Also, following Richardson (2006) the *total regression model* (i.e. all predictor variables are entered into the model without regard to tests of statistical significance) was employed in all the analyses reported in Section 5.2 to facilitate direct comparison.

As the data used in the present research comprised students taking programmes of different natures, it can be argued that the model depicted in Figure 5.1 has ignored the variations among programmes that were caused by their subject areas and types (although the size of these effects are mostly small, see Section 5.1.2 above). To simplify matters and to maintain direct comparability of results with other published work, the present study adopted the model shown in Figure 5.1 as the basis of investigation, but in each multiple regression analysis, *subject area* and *programme type* were entered into the regression equation before entering the other relevant observables, so that their possible effects were statistically adjusted. It should be noted that similar adjustment techniques have been reported in Severiens and Ten Dam (1997).

As programme type and subject area were originally measured by categorical variables in the present study, to render these observables fit for regression analyses, dummy variables were created for each programme type and each subject area. For every dummy variable, students who studied the programme type or subject area were assigned the value of 1 and all other students the value of 0. It should be noted that a similar approach was adopted in Vermunt (2005).

5.2.2 Relationships between Revised CEQ and ILS Scale Scores

Before regression analyses were conducted, simple correlations between the five scales of the revised CEQ and the 20 scales of the ILS were conducted to assess the relationships between students' perceptions of the learning context and their learning patterns. The results are summarized in Table 5.17, where correlation coefficients with magnitude greater than 0.3 (corresponding to a moderate effect) are highlighted in bold type for easy reference. It should be noted that all but five of the 100 correlations were statistical significant (at the 0.01 level); however, the associations between the two sets of observables might have been spurious, sharing a common cause in students' demographic background (indicated by Path A and Path B of Figure 5.1).

Partial correction coefficients were therefore calculated, controlling for the effects of students' demographic background (as well as programme type and subject area). The results are summarized in Table 5.18. It is obvious that these coefficients exhibit no or only negligible differences from their counterparts in Table 5.17. All but ten of the 100 partial correlations were statistically significant (at the 0.01 level). The above results suggest that the associations between students' perceptions and their learning patterns constitute genuine relationships (via Path C and Path D). Further analysis of these associations will be discussed in Section 5.2.7 and Section 5.3.1.

5.2.3 Relationships between Background Observables and Revised CEQ and ILS Scale Scores

Table 5.19 shows the standardized regression coefficients from multiple regression analyses relating the three background observables to students' scores on the five revised CEQ scales measured in the present study. The left-hand side of the table shows the effects of the background observables on CEQ scores, including any indirect effects mediated by ILS scores. The right-hand side of the table shows the direct effects of the background observables, controlling for possible indirect effects of ILS scores.

The findings indicate that the effects of the background observables on students' perceptions of the learning context (as measured by the CEQ) are mostly not significant. Students' prior qualifications have no effect on their perceptions, whether or not variations in ILS scores are controlled. However, older students tend to experience less *Emphasis on Independence* in their studies; this is true whether or not the possible effects of ILS scores are taken into account, indicating a direct effect of age on this aspect of students' perceptions. When variations in ILS scores are controlled, female students report experience of more *Appropriate Assessment* than male students.

Table 5.17 Correlation coefficients between the revised CEQ and the ILS scale scores

ILS Scale	Revised CEQ Scale				
	GT	AW1	AA	IN1	GS
Processing Strategy:					
Relating and Structuring	+0.14***	-0.08**	-0.12***	+0.22***	+0.24***
Critical Processing	+0.13***	-0.10***	-0.13***	+0.18***	+0.18***
Memorizing and Rehearsing	+0.18***	-0.06*	-0.15***	+0.18***	+0.26***
Analyzing	+0.20***	-0.07**	-0.12***	+0.22***	+0.26***
Concrete Processing	+0.22***	-0.07**	-0.15***	+0.19***	**+0.38*** **
Regulation Strategy:					
Self-reg.: L. Proc. & Results	+0.18***	-0.07**	-0.15***	+0.22***	+0.28***
Self-reg.: L. Content	+0.19***	-0.11***	-0.07**	+0.22***	+0.21***
External Reg.: L. Processes	+0.26***	-0.07**	-0.14***	+0.21***	**+0.31*** **
External Reg.: L. Results	+0.23***	-0.09***	-0.15***	+0.14***	**+0.32*** **
Lack of Regulation	+0.06*	-0.23***	-0.22***	+0.06*	+0.08**
Mental Model of Learning:					
Construction of Knowledge	**+0.40*** **	-0.17***	-0.27***	**+0.38*** **	**+0.57*** **
Intake of Knowledge	+0.25***	-0.26***	**-0.41*** **	+0.24***	**+0.39*** **
Use of Knowledge	**+0.30*** **	-0.19***	**-0.34*** **	+0.23***	**+0.52*** **
Simulating Education	**+0.36*** **	-0.17***	**-0.33*** **	**+0.32*** **	**+0.53*** **
Cooperative Learning	+0.29***	-0.28***	**-0.30*** **	**+0.30*** **	**+0.33*** **
Learning Orientation:					
Personally Interested	**+0.33*** **	-0.12***	-0.22***	**+0.36*** **	**+0.40*** **
Certificate-oriented	+0.20***	-0.25***	**-0.30*** **	+0.16***	+0.25***
Self-test-oriented	**+0.33*** **	-0.16***	-0.25***	**+0.34*** **	**+0.46*** **
Vocation-oriented	+0.28***	-0.09***	-0.24***	+0.24***	**+0.47*** **
Ambivalent	+0.04	**-0.34*** **	**-0.32*** **	+0.07**	-0.01

Revised CEQ Scale: GT – Good Teaching, AW1 – Appropriate Workload, AA – Appropriate Assessment, IN1 – Emphasis on Independence, GS – Generic Skills
*p<0.05, **p<0.01, ***p<0.001 (two-tailed test)

Table 5.18 Partial correlation coefficients between the revised CEQ and the ILS scale scores, controlling for the effects of programme type and subject area of programmes, and the age, gender and prior qualification of students

ILS Scale	Revised CEQ Scale				
	GT	AW1	AA	IN1	GS
Processing Strategy:					
Relating and Structuring	+0.14***	-0.06*	-0.11***	+0.22***	+0.24***
Critical Processing	+0.12***	-0.08**	-0.13***	+0.18***	+0.18***
Memorizing and Rehearsing	+0.18***	-0.04	-0.14***	+0.20***	+0.25***
Analyzing	+0.19***	-0.05	-0.11***	+0.22***	+0.26***
Concrete Processing	+0.19***	-0.05	-0.15***	+0.19***	**+0.36*****
Regulation Strategy:					
Self-reg.: L. Proc. & Results	+0.18***	-0.04	-0.15***	+0.23***	+0.28***
Self-reg.: L. Content	+0.18***	-0.08**	-0.07*	+0.22***	+0.20***
External Reg.: L. Processes	+0.27***	-0.05*	-0.13***	+0.23***	**+0.30*****
External Reg.: L. Results	+0.22***	-0.07**	-0.15***	+0.17***	**+0.30*****
Lack of Regulation	+0.06*	-0.22***	-0.21***	+0.07**	+0.07**
Mental Model of Learning:					
Construction of Knowledge	**+0.39*****	-0.15***	-0.28***	**+0.40*****	**+0.53*****
Intake of Knowledge	+0.24***	-0.27***	**-0.41*****	+0.25***	**+0.38*****
Use of Knowledge	+0.29***	-0.17***	**-0.35*****	+0.24***	**+0.50*****
Simulating Education	**+0.35*****	-0.16***	**-0.34*****	**+0.34*****	**+0.51*****
Cooperative Learning	+0.27***	-0.29***	**-0.30*****	+0.28***	**+0.33*****
Learning Orientation:					
Personally Interested	**+0.31*****	-0.12***	-0.23***	**+0.35*****	**+0.40*****
Certificate-oriented	+0.20***	-0.25***	**-0.30*****	+0.16***	+0.25***
Self-test-oriented	**+0.31*****	-0.16***	-0.26***	**+0.35*****	**+0.44*****
Vocation-oriented	+0.28***	-0.10***	-0.26***	+0.26***	**+0.45*****
Ambivalent	+0.04	**-0.35*****	**-0.32*****	+0.07**	+0.00

Revised CEQ Scale: GT – Good Teaching, AW1 – Appropriate Workload, AA – Appropriate Assessment, IN1 – Emphasis on Independence, GS – Generic Skills
*p<0.05, **p<0.01, ***p<0.001 (two-tailed test)

Table 5.19. Standardized regression coefficients relating age, gender and prior qualifications to students' scores on the revised CEQ scales

	Direct and Indirect Effects[a]			Direct Effects Only[b]		
Revised CEQ Scale	Age	Gender	Prior Qual.	Age	Gender	Prior Qual.
Good Teaching	+0.021	+0.017	+0.013	-0.002	-0.039	-0.029
Appropriate Workload	-0.051	+0.059*	+0.061	-0.058*	+0.064*	+0.033
Appropriate Assessment	+0.002	+0.037	-0.033	+0.003	**+0.074****	-0.034
Emphasis on Independence	**-0.093****	+0.004	-0.030	**-0.109****	-0.043	-0.066*
Generic Skills	+0.035	+0.013	+0.063*	+0.009	-0.051*	-0.005

[a] Not controlling for variations in ILS scores
[b] Controlling for variations in ILS scores
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

It should be noted that the above findings are in general comparable to those reported in Study 1 of Richardson (2006), which is a re-analysis of the data sets originally obtained in Lawless and Richardson (2002) that administered a research instrument comprising CEQ and simplified Approaches to Studying Inventory (ASI) scales to 1,800 students of the UK Open University. In that study, a direct (negative) effect of age on *Generic Skills* was found, with students' gender and prior qualifications being found as unrelated to their perceptions, whether or not variations in their study approaches were taken into account. However, in Study 2 of Richardson (2006) which is a re-analysis of the data sets originally obtained in Richardson (2005c) that administered the CEQ and the Revised ASI (RASI) to 3,593 students of the UK Open University, more effects of students' demographic background on their perceptions were identified.

Similarly, Table 5.20 shows the standardized regression coefficients relating the three background observables to students' scores on the 20 ILS scales. The left-hand side of the table shows the effects of the background observables on ILS scores, including any indirect effects mediated by CEQ scores. The right-hand side of the table shows the direct effects of the background observables, controlling for possible indirect effects of

CEQ scores.

The findings indicate that students' prior qualifications have basically no statistically significant effect on their learning patterns (as measured by the ILS). Students with lower prior qualifications tend to be more *Ambivalent* in their learning orientations; however, the relationship is not statistically significant when the possible effects of CEQ scores are taken into account, indicating that the said relationship is indirect and mediated by variations in students' perceptions.

Table 5.20 Standardized regression coefficients relating age, gender and prior qualifications to students' scores on the ILS scales

	Direct and Indirect Effects[a]			Direct Effects Only[b]		
ILS Scale	Age	Gender	Prior Qual.	Age	Gender	Prior Qual.
Processing Strategy:						
Relating and Structuring	+0.042	**-0.135*****	+0.056	+0.068*	**-0.132*****	+0.057
Critical Processing	+0.039	**-0.172*****	+0.065*	+0.052	**-0.168*****	+0.062*
Memorizing and Rehearsing	+0.023	+0.006	+0.047	+0.037	+0.010	+0.048
Analyzing	-0.010	**-0.077****	+0.016	+0.002	**-0.075****	+0.017
Concrete Processing	+0.035	**-0.109*****	+0.068*	+0.041	**-0.115*****	+0.061*
Regulation Strategy:						
Self-reg.: L. Proc. & Results	+0.050	**-0.081****	+0.042	+0.065*	**-0.081****	+0.046
Self-reg.: L. Content	**+0.082****	**-0.090****	+0.033	**+0.099****	**-0.089****	+0.041
External Reg.: L. Processes	+0.057	+0.012	+0.053	+0.074*	+0.013	+0.064*
External Reg.: L. Results	**+0.100****	-0.002	+0.045	**+0.108*****	-0.005	+0.050
Lack of Regulation	+0.054	-0.062*	+0.013	+0.056	-0.039	+0.023
Mental Model of Learning:						
Construction of Knowledge	+0.053	**+0.092****	+0.065*	+0.054	**+0.093*****	+0.052*
Intake of Knowledge	+0.007	**+0.134*****	-0.010	+0.006	**+0.150*****	-0.003
Use of Knowledge	+0.025	**+0.086****	+0.068*	+0.008	**+0.086*****	+0.045
Simulating Education	+0.051	**+0.101*****	+0.011	+0.045	**+0.099****	-0.008
Cooperative Learning	-0.069*	+0.041	-0.055	**-0.096****	+0.054*	+0.059*
Learning Orientation:						
Personally Interested	+0.022	**+0.102*****	+0.045	+0.052	**+0.103*****	+0.056
Certificate-oriented	+0.033	**+0.108*****	-0.004	+0.012	**+0.123*****	+0.029
Self-test-oriented	-0.024	**+0.076****	+0.026	-0.016	**+0.075****	+0.028
Vocation-oriented	+0.028	**+0.147*****	+0.042	+0.021	**+0.142*****	+0.022
Ambivalent	-0.012	+0.012	**-0.093****	-0.017	+0.042	-0.069*

[a] Not controlling for variations in CEQ scores
[b] Controlling for variations in CEQ scores
$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed test)

In regard to the effects of age, older students tend to experience more *Self-regulation on Learning Content* and *External Regulation on Learning Results*; this is true whether or not the possible effects of CEQ scores are taken into account, indicating a direct effect of age on these regulation strategies. When variations in CEQ scores are controlled, older students report less experience in *Cooperative Learning*.

It was also found that students' gender is significantly related to their learning patterns. Male students tend to report higher scores in all the processing strategies except *Memorizing and Rehearsing* and all the self-regulation strategies, but lower scores in all the mental models except *Cooperative Learning* and all the learning orientations except *Ambivalent*; this is true whether or not the possible effects of CEQ scores are taken into account, indicating a direct effect of gender on these aspects of students' learning patterns. Overall, these results suggest that male students tend more to be *active* learners, and female students tend more to be *passive* learners, and the tendency is unaffected by students' perceptions.

The findings of the present study cannot be directly compared to those of Richardson (2006) in a meaningful way, mainly due to the difference between the ILS and the ASI/RASI scales. However, it should be noted that both the present study and Study 1 of Richardson (2006) found that students' processing strategies are unrelated to their age. This is contrary to the common belief that older students tend more to be *deep* learners, a phenomenon deserving further exploration in future investigation.

5.2.4 Relationships between Background Observables and Students' Satisfaction and Expected Performance

Table 5.21 shows the standardized regression coefficients relating the three background observables to students' satisfaction with the programme. The findings indicate that students' satisfaction is not affected by their age, gender or prior qualifications, whether or not variations in students' perceptions and/or students' learning patterns are taken into account. It should be noted that similar results were found in Richardson (2006).

Table 5.21 Standardized regression coefficients relating students' age, gender and prior qualifications to their satisfaction with the programme

Controlled Variables	Age	Gender	Prior Qualification
No Control[a]	+0.027	-0.007	+0.071*
CEQ Scores[b]	+0.023	-0.018	+0.055*
ILS Scores[c]	+0.007	-0.057*	+0.030
CEQ and ILS Scores[d]	+0.015	-0.034	+0.046

[a] Not controlling for variations in students' perceptions and learning patterns
[b] Controlling for variations in students' perceptions, but including any indirect effects mediated by students' learning patterns
[c] Controlling for variations in students' learning patterns, but including any indirect effects mediated by students' perceptions
[d] Controlling for variations in both students' perceptions and learning patterns
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

Table 5.22 shows the standardized regression coefficients relating the three background observables to students' expected performance[19] in the programme. The findings indicate that while students' age and gender have no significant effect in this regard, students with higher prior qualifications tend to expect achieving higher performance; this is true whether or not variations in their perceptions and/or their learning patterns are taken into account, indicating a direct effect. It should be noted that similar results were found in Study 1 of Richardson (2006), although in that study students' academic

[19] As expected performance is measured in the reversed sense by the research instrument, the sign of the respective standardized regression coefficients was negated before reporting.

achievements were measured by overall marks, rather than expected performance.

Table 5.22 Standardized regression coefficients relating students' age, gender and prior qualifications to their expected performance in the programme

Controlled Variables	Age	Gender	Prior Qualification
No Control[a]	-0.001	+0.058*	**+0.159*****
CEQ Scores[b]	-0.007	+0.044	**+0.135*****
ILS Scores[c]	-0.013	+0.035	**+0.116*****
CEQ and ILS Scores[d]	-0.016	+0.040	**+0.113*****

[a] Not controlling for variations in students' perceptions and learning patterns
[b] Controlling for variations in students' perceptions, but including any indirect effects mediated by students' learning patterns
[c] Controlling for variations in students' learning patterns, but including any indirect effects mediated by students' perceptions
[d] Controlling for variations in both students' perceptions and learning patterns
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

5.2.5 Relationships between CEQ Scores and Students' Satisfaction and Expected Performance

Table 5.23 shows the standardized regression coefficients relating students' CEQ scores to their satisfaction with the programme. The findings indicate that students' satisfaction is significantly related to *Good Teaching*, *Emphasis on Independence* and the development of *Generic Skills*. These relationships are composed mainly of direct effects, with possible indirect or spurious effects mediated by students' background or learning patterns being small or negligible. It is noteworthy that contrary to the findings of most other published work such as Richardson (2006), the present study found no significant effect of *Appropriate Workload* or *Appropriate Assessment* on students' satisfaction, a phenomenon deserving further exploration in future investigation.

Table 5.23 Standardized regression coefficients relating students' CEQ scores to their satisfaction with the programme			
Predictor Variable	Direct, Indirect and Spurious Effects[a]	Direct and Indirect Effects[b]	Direct Effects Only[c]
Good Teaching	**+0.356*** **	**+0.355*** **	**+0.339*** **
Appropriate Workload	+0.040	+0.039	+0.015
Appropriate Assessment	+0.016	+0.019	+0.012
Emphasis on Independence	**+0.084** **	**+0.090** **	**+0.076** **
Generic Skills	**+0.208*** **	**+0.203*** **	**+0.166*** **

[a] Not controlling for variations in students' age, gender, prior qualifications and learning patterns
[b] Controlling for variations in students' age, gender and prior qualifications, but including any indirect effects mediated by students' learning patterns
[c] Controlling for variations in students' age, gender, prior qualifications and learning patterns
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

Table 5.24 shows the standardized regression coefficients relating students' CEQ scores to their expected performance in the programme. The findings indicate that students' expected performance is significantly related to *Good Teaching* and the development of *Generic Skills.* The effect of *Good Teaching* is mainly direct, and the effect of *Generic Skills* contains mainly a direct component and an indirect component mediated by students' learning patterns. The relationship between *Appropriate Workload* and students' expected performance comprises mainly indirect effects mediated by students' learning patterns, as it becomes non-significant after the possible effects of learning patterns are taken into account.

Table 5.24 Standardized regression coefficients relating students' CEQ scores to their expected performance in the programme			
Predictor Variable	Direct, Indirect and Spurious Effects[a]	Direct and Indirect Effects[b]	Direct Effects Only[c]
Good Teaching	**+0.105** **	**+0.102** **	**+0.094** **
Appropriate Workload	**+0.146*** **	**+0.135*** **	+0.067*
Appropriate Assessment	+0.011	+0.016	-0.012
Emphasis on Independence	-0.051	-0.038	-0.058
Generic Skills	**+0.242*** **	**+0.233*** **	**+0.135*** **

[a] Not controlling for variations in students' age, gender, prior qualifications and learning patterns
[b] Controlling for variations in students' age, gender and prior qualifications, but including any indirect effects mediated by students' learning patterns
[c] Controlling for variations in students' age, gender, prior qualifications and learning patterns
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

It should be noted that in Richardson (2006), significant effects of *Appropriate Assessment* and *Student Choice* (i.e. *Emphasis on Independence*) on students' overall marks were consistently found. The discrepancy of results between that and the present study should partly be attributable to the different outcome measures (overall marks vs. expected performance) and the different research contexts (distance learning in the UK higher education sector vs. regular learning in the post-secondary sector of Hong Kong). Nevertheless, in view of the common belief that assessment and performance should most likely be related, the fact that no significant effect of *Appropriate Assessment* on students' expected performance was found in the present study deserves further exploration in future investigation.

5.2.6 Relationships between ILS Scores and Students' Satisfaction and Expected Performance

Table 5.25 shows the standardized regression coefficients relating students' ILS scores to their satisfaction with the programme. When variations in students' background and perceptions are taken into account, students' satisfaction is significantly related to their scores on two learning orientation scales: being *Personally Interested* tends to result in higher satisfaction, and being *Ambivalent* tends to result in lower satisfaction. These relationships comprise mainly direct effects and indirect effects mediated by students' perceptions.

In the present study, the positive effects of *External Regulation of Learning Processes*, *Construct of Knowledge* and *Cooperative Learning* on students' satisfaction are mainly indirect ones mediated by students' perceptions, as they become non-significant when the possible effects of perceptions are taken into account. It should also be noted that similar to the findings in Richardson (2006), the present study found that students' processing strategies have basically no significant effects on their satisfaction with the programme.

Table 5.25 Standardized regression coefficients relating students' ILS scores to their satisfaction with the programme

Predictor Variable	Direct, Indirect and Spurious Effects[a]	Direct and Indirect Effects[b]	Direct Effects Only[c]
Processing Strategy:			
Relating and Structuring	-0.072	-0.076	-0.081*
Critical Processing	+0.006	-0.002	-0.008
Memorizing and Rehearsing	+0.060	+0.066	+0.073*
Analyzing	-0.024	-0.025	-0.048
Concrete Processing	+0.013	+0.008	-0.007
Regulation Strategy:			
Self-reg.: L. Proc. & Results	-0.039	-0.036	+0.015
Self-reg.: L. Content	+0.054	+0.054	+0.024
External Reg.: L. Processes	**+0.123*****	**+0.122*****	+0.050
External Reg.: L. Results	+0.039	+0.039	+0.032
Lack of Regulation	-0.041	-0.043	-0.010
Mental Model of Learning:			
Construction of Knowledge	**+0.109****	**+0.109****	+0.008
Intake of Knowledge	-0.008	-0.004	-0.007
Use of Knowledge	-0.013	-0.017	-0.031
Simulating Education	+0.062	+0.065	+0.010
Cooperative Learning	**+0.118*****	**+0.117*****	+0.051*
Learning Orientation:			
Personally Interested	**+0.137*****	**+0.140*****	**+0.077****
Certificate-oriented	-0.037	-0.038	-0.048
Self-test-oriented	+0.062*	+0.061	+0.003
Vocation-oriented	+0.023	+0.029	+0.012
Ambivalent	**-0.136*****	**-0.134*****	**-0.070****

[a] Not controlling for variations in students' age, gender, prior qualifications and perceptions
[b] Controlling for variations in students' age, gender and prior qualifications, but including any indirect effects mediated by students' perceptions
[c] Controlling for variations in students' age, gender, prior qualifications and perceptions
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

Table 5.26 shows the standardized regression coefficients relating students' ILS scores to their expected performance in the programme. When variations in students' background and perceptions are taken into account, students' expected performance is significantly related to their scores on three scales: students who adopt *External Regulation of Learning Processes* tend to expect higher performance, and students who experience *Lack of Regulation* or who are *Ambivalent* (i.e. the two key features of the undirected learning pattern) tend to expect lower performance. These relationships comprise mainly direct effects, and to a lesser extent indirect effects mediated by students' perceptions.

Table 5.26 Standardized regression coefficients relating students' ILS scores to their expected performance in the programme

Predictor Variable	Direct, Indirect and Spurious Effects[a]	Direct and Indirect Effects[b]	Direct Effects Only[c]
Processing Strategy:			
Relating and Structuring	+0.006	+0.004	+0.006
Critical Processing	-0.023	-0.023	-0.022
Memorizing and Rehearsing	+0.024	+0.018	+0.017
Analyzing	-0.016	-0.006	-0.014
Concrete Processing	+0.053	+0.054	+0.033
Regulation Strategy:			
Self-reg.: L. Proc. & Results	+0.056	+0.057	+0.070
Self-reg.: L. Content	-0.035	-0.032	-0.027
External Reg.: L. Processes	**+0.155*****	**+0.149*****	**+0.129*****
External Reg.: L. Results	+0.007	+0.004	+0.005
Lack of Regulation	**-0.119*****	**-0.118*****	**-0.097****
Mental Model of Learning:			
Construction of Knowledge	-0.018	-0.020	-0.045
Intake of Knowledge	-0.079*	-0.081*	-0.077*
Use of Knowledge	-0.043	-0.048	-0.066
Simulating Education	**+0.118****	**+0.115****	+0.088*
Cooperative Learning	+0.009	+0.019	+0.009
Learning Orientation:			
Personally Interested	+0.066*	+0.059	+0.045
Certificate-oriented	+0.052	+0.052	+0.054
Self-test-oriented	+0.085*	**+0.087****	+0.072*
Vocation-oriented	+0.046	+0.045	+0.029
Ambivalent	**-0.201*****	**-0.194*****	**-0.158*****

[a] Not controlling for variations in students' age, gender, prior qualifications and perceptions
[b] Controlling for variations in students' age, gender and prior qualifications, but including any indirect effects mediated by students' perceptions
[c] Controlling for variations in students' age, gender, prior qualifications and perceptions
*p<0.05, **p<0.01, ***p<0.001 (two-tailed test)

The findings also indicate that the positive effects of *Stimulating Education* and students being *Self-test-oriented* on students' expected performance are mainly indirect, as they become non-significant when variations in students' perceptions are taken into account. Again, the results cannot be directly compared to those of Richardson (2006) in a meaningful way, mainly due to the difference between the ILS and the ASI/RASI.

However, it is noteworthy that the present study found a significant relationship between undirected learning pattern and (expectation of) low academic performance, which is consistent with the findings of most published work, e.g. Busato *et al.* (1998).

5.2.7 Interim Discussion

Richardson has commented on the novelty of the general theoretical model that is similar to that depicted in Figure 5.1, and suggested that "it would be desirable to replicate the findings using different data sets and possibly different instruments" (Richardson, 2006:881). The above analyses conducted in the present study, which administered an instrument comprising the CEQ and the ILS to 1,572 post-secondary students in Hong Kong, can be viewed as an attempt to respond to that suggestion. At this juncture, it is appropriate to summarize again the present findings and discuss the possibility of the causal links denoted by the individual paths of the model.

For Path A of the model, the present findings (reported in Table 5.19) suggest that the effects of students' demographic background on their perceptions of the learning context are mostly not significant. In particular, it should be acceptable if variations in students' demographic background are not taken into account when the CEQ is used to compare academic quality across different programmes or institutions[20]. This is in contrary to the findings of Richardson (2006) whereby more direct effects of students' demographic background on their perceptions were identified (especially in Study 2). In regard to his findings, Richardson has made the following remark:

[20] Whether the CEQ itself can serve as a good quality indicator for direct comparison of programmes or institutions is of course still debatable.

> These findings refute the proposals of Saldo and Richardson (2003) and Richardson (2005c) that demographic characteristics do not influence students' scores on the CEQ. They suggest that the CEQ should not be used to compare academic quality across different courses or programmes without taking account of variations in the students' demographic background. Nevertheless, to the extent that students taking programmes in the same subject will be demographically similar, it will still be valid to make comparisons across different institutions at the level of particular subjects of study.
>
> (Richardson, 2006:886)

The author opines that with the recent global trend in massive post-secondary education, students taking programmes in the same subject will increasingly be demographically *dissimilar* (in terms of their age, gender, prior qualification and other relevant observables), and the above argument of Richardson will therefore be increasingly unconvincing. On the other hand, as contrary findings have been reported in different studies on the possibility of the causal links denoted by Path A, further exploration should be conducted on this issue in future investigation.

For Path B, an issue of interest is whether the present study accords with "a general pattern identified in previous research whereby older students exhibit more desirable study behaviour than younger students" (Richardson, 2006:886). In this regard, the present findings (reported in Table 5.20) can be viewed as being largely in disaccord with this pattern, as it identified only a few effects of age on students' regulation strategies. Specifically, the present study found students' processing strategies to be unrelated to their age, and it is worth noting that similar findings were in fact reported in Study 1 (but not Study 2) of Richardson (2006). Nevertheless, while these initial results deserve further exploration, the narrow age range of the participating students (which mainly varied from 18 to 22) may be a factor contributing to the present findings.

The present study identifies significant direct effects of gender on students' learning patterns. However, unlike the findings of some previous research (e.g., female students may be more reproduction oriented or more strategic in their study behaviour), the present findings suggest that female students tend more to be *passive* learners, and male students tend more to be *active* learners.

Unlike the findings of Richardson (2006:887) whereby "higher prior qualifications lead to higher scores on specific aspects of desirable study behaviour (i.e. a deep approach) and to lower scores on specific aspects of less desirable study behaviour (i.e. a surface approach)", students' prior qualifications were found to be unrelated to their learning patterns in the present study. However, it should be noted that the operationalization of students' prior qualifications had a much wider range in Richardson's study (i.e. based on UK students' results in the GCE Ordinary Level or GCE Advanced Level, as well as qualifications beyond the GCE Advanced Level) than in the present study (i.e. based only on Hong Kong students' number of passes in the HKCEE, which is equivalent to the GCE Ordinary Level), and this may be a factor contributing to the present findings.

For Path G, the present findings (reported in Table 5.21 and Table 5.22) suggest that students' satisfaction with the programme is unbiased by their demographic background. Moreover, students' expected performance is unaffected by their age or gender but affected by their prior qualifications, although the operationalization of these qualifications in the present study was limited to a comparatively narrow range. It should be noted that the present findings are largely in consistent with those reported in Richardson (2006) and most previous research.

For Path E, the present findings (reported in Table 5.23 and Table 5.24) identify direct effects of students' perceptions of their learning environment on their satisfaction with, and expected performance in, the programme (as two measures of the learning outcome). It is reassuring to find positive effects of *Good Teaching* and *Generic Skills* on both outcome measures, and positive effects of *Emphasis on Independence* on satisfaction. However, it is surprising to find no effect of *Appropriate Assessment* on both outcome measures. To a certain extent, it is less surprising to find only indirect effects of *Appropriate Workload* (mediated by students' learning patterns) on expected performance, as it is likely that students' perceptions of workload are affected by many factors, including the teaching and learning environments and students' learning patterns (e.g., see Kember *et al.* (1996) for a study on these issues). Nevertheless, as these findings are in contrary to widely held views on the relationships between assessment, workload and outcome measures, further exploration on the issues should be conducted in future investigation.

For Path F, the present findings (reported in Table 5.25 and Table 5.26) identify no effect of students' processing strategies on their satisfaction and expected performance. A few effects of students' regulation strategies on the outcome measures are found, especially for *External Regulation of Learning Processes*. It should be noted that the present study finds no tendency of students adopting deep study approach to have higher (expected) performance, and students adopting surface study approach to have low performance, which is contrary to the results reported in some published work. In this regard, cultural differences between western and Hong Kong students whereby aspects of deep and surface approaches are interwoven more closely for the latter group of students should be a factor contributing to the present findings. The present findings are in fact consistent with the remark that previous research has proved it "hard to establish an unambiguous relationship between study behaviour and performance" (Richardson, 2006:887). Nevertheless, it is worth reiterating that the present study identifies a significant relationship between undirected learning pattern and low (expected) performance, which is a finding consistently reported in most previous research. It is also interesting to find that among the four ILS components only learning orientations are directly related to students' satisfaction, as manifested in the positive effect of *Personally Interested*, and the negative effect of *Ambivalent*.

Finally, for Path C and Path D, the results in Table 5.17 and Table 5.18 suggest the possibility of genuine associations between students' perceptions and their learning patterns. Further evidence for the causal efficacy of Path C comes from the effects of students' learning patterns on outcome measures that are mediated by students' perceptions (i.e. via Path C $\rightarrow$ E), as manifested in the indirect components of the effects of *External Regulation of Learning Processes*, *Construction of Knowledge* and *Cooperative Learning* on students' satisfaction (whose removal renders the effects concerned non-significant, see Table 5.25), and the indirect components of the effects of *Stimulating Education* and *Self-test-oriented* on students' expected performance (whose removal renders the effects concerned non-significant, see Table 5.26).

Further evidence for the causal efficacy of Path D comes from the effects of students' demographic background on students' learning patterns that are mediated by their perceptions (i.e. via Path A $\rightarrow$ D), as manifested in the indirect component of the effect of students' prior qualifications on *Ambivalent* (whose removal renders the effect concerned non-significant, see Table 5.20). Evidence also comes from the effects of students' perceptions on outcome measures that are mediated by students' learning patterns (i.e. via Path D $\rightarrow$ F), as manifested in the indirect component of the effect of *Appropriate Workload* on students' expected performance (whose removal renders the effect concerned non-significant, see Table 5.24).

In regard to the relationship between students' perceptions of their learning environment and their study behavior (or their learning patterns as investigated in the present study), the following four possibilities proposed in previous research are summarized in Richardson (2006:870):

- The first possibility was inferred by many researchers, e.g. Lizzio *et al.* (2002) from the results of the early interview-based studies that variations in students' perceptions of their learning environment give rise to variations in their study behavior.

- The second possibility is that students acquire more positive perceptions of their learning environment if they find they have adopted more congenial forms of study behavior.

- The third possibility is that the causal link between perceptions and study behavior is bi-directional in nature.

- Finally, the fourth possibility was proposed by some researchers, e.g. Trigwell and Prosser (1997), which suggests that students' perceptions and study behavior are not independently constituted but are considered as simultaneously presented in the students' awareness, i.e. students' perceptions and study behavior are not distinct ontological categories, but are different aspects of a single category.

Based on the above evidence for both Path C and Path D, and the following results in the present study:

- Direct effects of students' perceptions on outcome measures are found even when students' learning patterns are controlled (cf. Table 5.23 and Table 5.24), and

- Direct effects of students' learning patterns on outcome measures are found even when students' perceptions are controlled (cf. Table 5.25 and Table 5.26)

An argument similar to that proposed in Richardson (2006) can be made, i.e. students' perceptions and learning patterns cannot be of the same category, and both the two causal links as denoted by Path C and Path D exist. In other words, among the four above-proposed possibilities, only the third account can accommodate the findings of the present study. It can therefore be inferred that there exists a bi-directional causal relationship between variations in students' perceptions and their learning patterns, and as a result attempts to enhance the quality of student learning need to address both of these two constructs.

5.2.8 General Theoretical Model on Relationships among the ILS Components

Unlike the inventories used in most previous research into student learning (e.g. the ASI) which focus on students' processing strategies and learning motivations, the ILS is an instrument based on the second generation of conceptualizations about student learning (cf. Section 3.1.1), attempting to incorporate a wider range of explanatory constructs (especially students' regulation strategies). With the development of the ILS, Vermunt proposed his model of regulation of constructive learning processes, and hypothesized the central role of regulation strategies in this model (cf. Section 3.2.2). The main purpose of this part of the present research is to verify Vermunt's hypothesis and to investigate if his model applies also to the post-secondary education of Hong Kong, in the new response context of the present study.

The problem was approached by systematic analyses of the relationships among the four components of the ILS, based on the model depicted in Figure 5.2. Like the model depicted in Figure 5.1, this model is derived from the approach adopted by Richardson (2006, 2007), which analyzes the hypothesized patterns of causal relationships among the constructs concerned by means of path analysis based on multiple regression analyses. The conduct of multiple regression analyses, when organized in a systematic manner as proposed by Richardson (see Section 5.2.1), enables more explicit identification of the possible components of the relationships in the model, in terms of *direct effect*, *indirect effect* and *spurious effect*.

At this juncture, it is worth noting that Vermunt's model (as depicted in Figure 3.2) is in fact embedded in the proposed model (as depicted in Figure 5.2), with the same four boxes denoting the ILS components, and the five links in Vermunt's model corresponding to Path B, Path D, Path E, Path F and Path G in the proposed model. By using the proposed model for investigation, the present study was able not only to apply the techniques developed by Richardson in analyzing the relationships among the ILS components, but also to explore the possibilities of Path A and Path C which were excluded from Vermunt's model. To the knowledge of the author, the present research represents the first attempt to analyze the ILS components in such a systematic manner.

Similar to the methodology mentioned in Section 5.2.1, in each multiple regression analysis conducted for this part of the study, *subject area* and *programme type* were entered into the regression equation before entering the other relevant observables, so that their possible effects (although most of which may be small or negligible) were statistically adjusted.

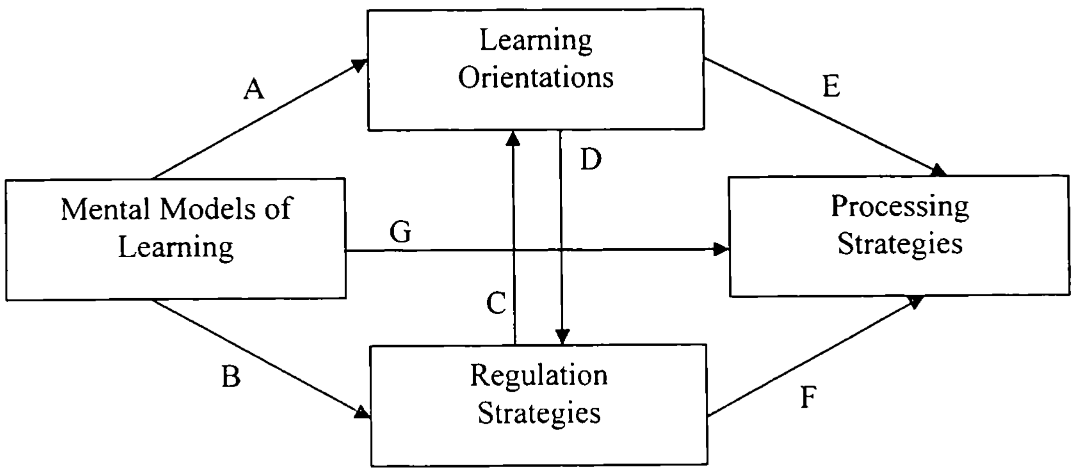

Figure 5.2 A General Theoretical Model of Relationships among the Components Measured by the ILS

5.2.9 Relationships between Students' Learning Orientations and Students' Regulation Strategies

Before regression analyses were conducted, simple correlations between the five ILS scales measuring students' learning orientations and the five ILS scales measuring students' regulation strategies were calculated in order to assess the magnitude of the relationships between the two sets of observables. The results are summarized in Table 5.27, where correlation coefficients with magnitudes greater than 0.3 (corresponding to a moderate effect) are highlighted in bold type for easy reference. It should be noted that

18 out of the 25 correlations were statistically significant (at the 0.01 level). However, the associations between the two sets of observables might have been spurious, sharing a common cause in students' mental models of learning (indicated by Path A and Path B of Figure 5.2).

Partial correlation coefficients were therefore calculated, controlling for the effects of students' mental models. The results are summarized in Table 5.28. It is obvious that these coefficients exhibit no or only negligible differences from their counterparts in Table 5.27. Furthermore 18 (out of the 25) correlations remain statistically significant (at the 0.01 level). These correlation analysis results suggest that the associations between students' learning orientations and their regulation strategies constitute genuine relationships (via Path C and Path D). Further analysis of these associations will be discussed in Section 5.2.15 and Section 5.3.2.

5.2.10 Relationships between Students' Mental Models and Students' Learning Orientations

Table 5.29 contains the standardized regression coefficients relating students' mental models of learning to their learning orientations. The left-hand side of the table shows the effects of students' mental models on their learning orientations, including any indirect effects mediated by students' regulation strategies. The right-hand side of the table shows the direct effects of mental models, controlling for possible indirect effects of regulation strategies.

Table 5.27 Correlation coefficients between students' learning orientations and regulation strategies

Regulation Strategy	Learning Orientation				
	PERS	CERT	SETE	VOCA	AMBI
Self-reg.: L. Proc. & Results	+0.23***	-0.06*	+0.17***	+0.02	+0.02
Self-reg.: L. Content	+0.24***	-0.01	+0.25***	+0.11***	+0.00
External Reg.: L. Processes	+0.21***	+0.19***	+0.27***	+0.28***	+0.06*
External Reg.: L. Results	+0.20***	+0.18***	+0.29***	**+0.31*****	+0.06*
Lack of Regulation	+0.11***	+0.16***	+0.14***	+0.14***	**+0.32*****

Learning Orientation: PERS – personally interested, CERT – certificate-oriented, SETE – self-test-oriented, VOCA – vocation-oriented, AMBI - ambivalent
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

Table 5.28 Partial correlation coefficients between students' learning orientations and regulation strategies, controlling for the effects of programme type and subject area of programmes, and the mental models of students

Regulation Strategy	Learning Orientation				
	PERS	CERT	SETE	VOCA	AMBI
Self-reg.: L. Proc. & Results	+0.22***	-0.06*	+0.17***	+0.03	+0.01
Self-reg.: L. Content	+0.24***	-0.01	+0.25***	+0.11***	+0.00
External Reg.: L. Processes	+0.21***	+0.18***	+0.26***	+0.27***	+0.06*
External Reg.: L. Results	+0.20***	+0.18***	+0.28***	+0.28***	+0.07*
Lack of Regulation	+0.12***	+0.16***	+0.14***	+0.14***	**+0.33*****

Learning Orientation: PERS – personally interested, CERT – certificate-oriented, SETE – self-test-oriented, VOCA – vocation-oriented, AMBI - ambivalent
*$p<0.05$, **$p<0.01$, ***$p<0.001$ (two-tailed test)

These findings indicate that students with a *Construction of Knowledge* emphasis mental model tend to be more *Personally Interested*, *Self-test-oriented* and *Vocation-oriented*; this is true whether or not variations in regulation strategies are controlled, indicating a direct effect.

Students with an *Intake of Knowledge* emphasis mental model tend more to exhibit all the learning orientations except *Personally Interested*; the effects are mainly direct, and in the case of *Vocation-oriented* the effect also comprises an indirect component mediated by regulation strategies.

Students with a *Use of Knowledge* emphasis mental model tend more to exhibit all the learning orientations except *Ambivalent*; this is true whether or not variations in regulation strategies are controlled, indicating a direct effect.

Stimulating Education has no direct effect on students' learning orientations. Students with this mental model tend more to be *Self-test-oriented*; however, the relationship is not statistically significant when the possible effects of regulation strategies are controlled, indicating that the effect is an indirect one.

Students with a *Cooperative Learning* emphasis mental model tend more to exhibit all the learning orientations except *Vocation-oriented*; this is true whether or not variations in regulation strategies are controlled, indicating a direct effect.

Overall, the above findings suggest the possible existence of significant direct effects of students' mental models on their learning orientations, an empirical finding believed not to have been previously reported in the literature and one which deserves further exploration in future studies.

At this point it is also appropriate to acknowledge a limitation in the direct adoption of Richardson's model for analytical purposes in the present study; namely, the fixation of the links' directionality in the model. For example, the direction of Path A in the model depicted in Figure 5.2 is debatable, as the reversed direction is also plausible. Consequently, the current approach of adapting Richardson's model to analyzing the ILS should be viewed as a simplified representation of the real world, but justified by consistency and parsimony considerations and containing Vermunt's model as an embedded feature.

5.2.11 Relationships between Students' Mental Models and Students' Regulation Strategies

Table 5.30 shows the standardized regression coefficients relating students' mental models of learning to their regulation strategies. The findings indicate that students with a *Construction of Knowledge* emphasis mental model tend more to adopt self-regulation strategies. These relationships comprise mainly direct effects, and to a lesser extent indirect effects mediated by students' learning orientations. The effect of *Construction of Knowledge* on *External Regulation of Learning Processes* is mainly indirect, as it becomes non-significant when variations in students' learning orientations are taken into account.

Students with an *Intake of Knowledge* emphasis mental model tend more to adopt external regulation strategies; this is true whether or not variations in students' learning orientations are controlled, indicating a direct effect. The effects of *Intake of Knowledge* on the two self-regulation strategies and *Lack of Regulation* are mainly indirect, as they become non-significant when variations in students' learning orientations are taken into account.

Use of Knowledge and *Cooperative Learning* have no effect on students' regulation strategies. Students with a *Stimulating Education* emphasis mental model tend more to practice *External Regulation of Learning Results*; this is true whether or not variations in regulation strategies are controlled, indicating a direct effect.

Overall, the above findings are largely consistent with those of other published studies, especially the association of *Construction of Knowledge* with self-regulation strategies, and the association of *Intake of Knowledge* with external regulation strategies (Vermunt, 1998).

5.2.12 Relationships between Students' Mental Models and Students' Processing Strategies

Table 5.31 shows the standardized regression coefficients relating students' mental models of learning to their processing strategies. The findings indicate that mental models have basically no direct effect on *Relating and Structuring*. The positive effect of *Construction of Knowledge* is mainly an indirect one mediated by students' regulation strategies, as the coefficient reduces substantially when variations in regulation strategies are controlled. The negative effect of *Intake of Knowledge* is also an indirect one, but mediated by both students' learning orientations and students' regulation strategies, as the coefficient becomes non-significant when variations in either of the latter are taken into account.

Mental models also have no direct effect on *Critical Processing*. The positive effect of *Construction of Knowledge* or *Stimulating Education* is mainly an indirect one mediated by students' regulation strategies, as the coefficient becomes non-significant when variations in regulation strategies are controlled. The negative effect of *Intake of Knowledge* is also an indirect one, but mediated by both students' learning orientations and students' regulation strategies, as the coefficient becomes non-significant when variations in either of the latter are taken into account.

The findings also indicate that mental models have no direct effect on both *Memorizing and Rehearsing* and *Analyzing*. The positive relationship of *Construction of Knowledge* with each of these two processing strategies comprises mainly indirect effects mediated by students' regulation strategies, as the coefficients become non-significant when variations in regulation strategies are controlled.

It is interesting to find direct effects of mental models on *Concrete Processing* for all the three different conceptions of knowledge, as the respective coefficients remain significant even when variations in both students' learning orientations and students' regulation strategies are taken into account. The changes in coefficients indicate that for *Construction of Knowledge*, the positive effect comprises a smaller direct component and a larger indirect component mediated by students' regulation strategies. For *Intake of Knowledge*, the negative effect comprises largely a direct component and a moderate indirect component mediated by students' learning orientations. For *Use of Knowledge*, the positive effect is mainly a direct one.

Overall, the above findings suggest only a few direct effects of students' mental models on their processing strategies, and these effects are mainly manifested in the negative influence of *Intake of Knowledge* and the positive influence of *Use of Knowledge* and *Construction of Knowledge* on *Concrete Processing*. However, it is worth noting that the magnitude of many of the standardized regression coefficients in Table 5.31 is substantially reduced when variations in students' regulation strategies are controlled (and consequentially some of these coefficients become statistically non-significant), indicating the significant roles of students' regulation strategies in the indirect effects of students' mental models on their processing strategies.

Table 5.29 Standardized regression coefficients relating students' mental models of learning to students' learning orientations

	Direct and Indirect Effects[a]					Direct Effects Only[b]				
Learning Orientation	CONS	INTA	USE	STIM	COOP	CONS	INTA	USE	STIM	COOP
Personally Interested	**+0.251*****	-0.027	**+0.224*****	+0.064	**+0.114*****	**+0.212*****	-0.011	**+0.234*****	+0.054	**+0.109*****
Certificate-oriented	-0.066*	**+0.386*****	**+0.197*****	+0.018	**+0.067****	-0.026	**+0.338*****	**+0.187*****	+0.018	**+0.068****
Self-test-oriented	**+0.200*****	**+0.118*****	**+0.210*****	**+0.088****	**+0.086*****	**+0.162*****	**+0.116*****	**+0.210*****	+0.070*	**+0.083****
Vocation-oriented	**+0.106*****	**+0.147*****	**+0.406*****	+0.066*	-0.019	**+0.129*****	**+0.094*****	**+0.399*****	+0.058	-0.019
Ambivalent	-0.090*	**+0.249*****	-0.006	+0.089*	**+0.162*****	-0.049	**+0.220*****	-0.018	+0.088*	**+0.154*****

Mental models of learning: CONS – construction of knowledge, INTA – intake of knowledge, USE – use of knowledge, STIM – stimulating education, COOP – cooperative learning

[a] Not controlling for variations in students' regulation strategies

[b] Controlling for variations in students' regulation strategies

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed test)

Table 5.30 Standardized regression coefficients relating students' mental models of learning to students' regulation strategies

	Direct and Indirect Effects[a]					Direct Effects Only[b]				
Regulation Strategy	CONS	INTA	USE	STIM	COOP	CONS	INTA	USE	STIM	COOP
Self-reg.: L. Proc. & Results	**+0.317*****	**-0.105****	+0.004	+0.095*	+0.015	**+0.254*****	-0.050	-0.075*	+0.057	+0.007
Self-reg.: L. Content	**+0.247*****	**-0.102****	-0.071*	+0.072	+0.032	**+0.177*****	-0.050	-0.075*	+0.057	+0.007
External Reg.: L. Processes	**+0.137*****	**+0.172*****	-0.010	+0.080*	+0.027	+0.095*	**+0.157*****	-0.083*	+0.067	+0.026
External Reg.: L. Results	+0.086*	**+0.142*****	+0.040	**+0.113****	+0.003	+0.043	**+0.123*****	-0.035	**+0.097****	-0.001
Lack of Regulation	-0.035	**+0.151*****	+0.044	+0.061	+0.032	-0.018	+0.081*	+0.030	+0.030	-0.014

Mental models of learning: CONS – construction of knowledge, INTA – intake of knowledge, USE – use of knowledge, STIM – stimulating education, COOP – cooperative learning

a Not controlling for variations in students' learning orientations

b Controlling for variations in students' learning orientations

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed test)

Table 5.31 Standardized regression coefficients relating students' mental models of learning to their processing strategies

Relating and Structuring					
Controlled Variables	CONS	INTA	USE	STIM	COOP
No Control[a]	**+0.297*****	**-0.101****	-0.062	+0.036	+0.042
LO Scores[b]	**+0.233*****	-0.053	-0.070	+0.018	+0.022
RS Scores[c]	**+0.065****	-0.037	-0.048*	-0.041	+0.022
LO and RS Scores[d]	+0.055*	-0.024	-0.051*	-0.045	+0.021
Critical Processing					
Controlled Variables	CONS	INTA	USE	STIM	COOP
No Control[a]	**+0.222*****	**-0.108****	-0.080*	**+0.116****	+0.022
LO Scores[b]	**+0.175*****	-0.069*	-0.055	**+0.101****	-0.010
RS Scores[c]	+0.001	-0.032	-0.065*	+0.045	+0.005
LO and RS Scores[d]	+0.006	-0.032	-0.036	+0.040	-0.010
Memorizing and Rehearsing					
Controlled Variables	CONS	INTA	USE	STIM	COOP
No Control[a]	**+0.177*****	+0.065*	+0.001	+0.048	+0.021
LO Scores[b]	**+0.134*****	+0.056	-0.052	+0.032	+0.012
RS Scores[c]	+0.022	+0.029	+0.002	-0.029	+0.003
LO and RS Scores[d]	+0.018	+0.016	-0.021	-0.031	+0.007
Analyzing					
Controlled Variables	CONS	INTA	USE	STIM	COOP
No Control[a]	**+0.260*****	-0.035	-0.062	+0.071	+0.014
LO Scores[b]	**+0.202*****	-0.007	-0.079*	+0.057	-0.002
RS Scores[c]	+0.038	-0.026	-0.050*	-0.016	-0.005
LO and RS Scores[d]	+0.038	-0.025	-0.040	-0.017	-0.009
Concrete Processing					
Controlled Variables	CONS	INTA	USE	STIM	COOP
No Control[a]	**+0.263*****	**-0.141*****	**+0.175*****	+0.068	+0.009
LO Scores[b]	**+0.209*****	**-0.097****	**+0.148*****	+0.057	+0.005
RS Scores[c]	**+0.097*****	**-0.132*****	**+0.175*****	-0.006	-0.006
LO and RS Scores[d]	**+0.087****	**-0.105*****	**+0.165*****	-0.005	+0.005

Mental models of learning: CONS – construction of knowledge, INTA – intake of knowledge, USE – use of knowledge, STIM – stimulating education, COOP – cooperative learning

[a] Not controlling for variations in students' learning orientations and regulation strategies

[b] Controlling for variations in students' learning orientations, but including any indirect effects mediated by students' regulation strategies

[c] Controlling for variations in students' regulation strategies, but including any indirect effects mediated by students' learning orientations

[d] Controlling for variations in both students' learning orientations and regulation strategies

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed test)

5.2.13 Relationships between Students' Learning Orientations and Students' Processing Strategies

Table 5.32 shows the standardized regression coefficients relating students' learning orientations to their processing strategies. The findings indicate that *Certificated-oriented* students tend less to adopt *Relating and Structuring* in their learning, as indicated by the negative direct effect being significant even when variations in students' mental models and students' regulation strategies are controlled. The positive effect of *Personally Interested* or *Self-test-oriented* is mainly an indirect one mediated by students' regulation strategies, as the coefficient becomes non-significant when variations in regulation strategies are controlled.

For *Critical Processing*, the significant direct effects indicate that *Vocation-oriented* students tend less, and that *Ambivalent* students tend more, to adopt this processing strategy in their learning. The positive effects of *Personally Interested* or *Self-test-oriented* and the negative effect of *Certificate-oriented* are mainly indirect ones mediated by students' regulation strategies, as the respective coefficients become non-significant when variations in regulation strategies are controlled.

Students' learning orientations have no direct effect on *Memorizing and Rehearsing*. The positive effect of *Self-test-oriented* is mainly an indirect one mediated by students' regulation strategies, as the coefficient becomes non-significant when variations in regulation strategies are controlled. The positive relationship of *Vocation-oriented* and *Memorizing and Rehearsing* is a spurious effect with students' mental models being the common cause, as it becomes non-significant when only variations in mental models are controlled. The results in Tables 5.29 to 5.31 and Table 5.33 indicate that this effect is mainly caused by *Construction of Knowledge* and *Intake of Knowledge*, with the effect on *Vocation-oriented* being direct (via Path A of Figure 5.2), and the effect on *Memorizing and Rehearsing* being indirectly mediated by regulation strategies (via Path B $\rightarrow$ F)[21].

---

[21] Table 5.29 indicates that the possible sources of direct effect of students' mental models on *Vocation-oriented* (via Path A) are from *Construction of Knowledge*, *Intake of Knowledge* and *Use of Knowledge*. However, Table 5.31 indicates that all the students' mental models have no direct effect on *Memorizing and Rehearsing* (via Path G), so the remaining choice is the exercise of indirect effect via Path B$\rightarrow$F. In

Students' learning orientations also have no direct effect on *Analyzing*. The findings indicate that when *Certificate-oriented* students tend less, and *Self-test-oriented* students tend more, to adopt this processing strategy in their learning, the main underlining cause is the indirect effects mediated by students' regulation strategies. The positive relationship of *Personally Interested* and *Analyzing* is a spurious effect with students' mental models being the common cause, as it becomes non-significant when only variations in mental models are controlled. The results in Tables 5.29 to 5.31 and Table 5.33 indicate that this effect is mainly caused by *Construction of Knowledge*, with the effect on *Personally Interested* being direct (i.e. via Path A of Figure 5.2), and the effect on *Analyzing* being indirectly mediated by regulation strategies (via Path B → F)[22].

Certificate-oriented students tend less to adopt *Concrete Processing* in their learning, and this negative effect comprises mainly a direct component, and to a lesser extent an indirect component mediated by students' regulation strategies. The effect of *Personally Interested* on *Concrete Processing* is largely an indirect one mediated by students' regulation strategies. Both the relationship of *Self-test-oriented* and *Concrete Processing* and the relationship of *Vocation-oriented* and *Concrete Processing* are spurious effects, with students' mental models being the common cause. The results in

---

this regard, Table 5.30 indicates that from the above three possible mental models, direct effect via Path B can be exercised from *Construction of Knowledge* to self-regulation strategies and from *Intake of Knowledge* to external regulation strategies (so *Use of Knowledge* can be excluded), and Table 5.33 confirms the direct effect of both self-regulation strategies and external regulation strategies on *Memorizing and Rehearsing* (via Path F).

[22] Table 5.29 indicates that the possible sources of direct effect of students' mental models on *Personally Interested* (via Path A) are from *Construction of Knowledge, Use of Knowledge* and *Cooperative Learning*. However, Table 5.31 indicates that all the students' mental models have no direct effect on *Analyzing* (via Path G), so the remaining choice is the exercise of indirect effect via Path B→F. In this regard, Table 5.30 indicates that from the above three possible mental models, direct effect via Path B can only be exercised from *Construction of Knowledge* to self-regulation strategies (so *Use of Knowledge* and *Cooperative Learning* can be excluded), and Table 5.33 confirms the direct effect of self-regulation strategies on *Analyzing* (via Path F).

Tables 5.29 and 5.31 indicate that in both cases, the association is mainly caused by the direct effects of *Construction of Knowledge*, *Intake of Knowledge* and *Use of Knowledge* on the constructs concerned (via Path A and Path G of Figure 5.2)[23].

Overall, the above findings suggest some direct effects of students' learning orientations on their processing strategies, which are mainly manifested in the negative influence of *Certificate-oriented* on *Relating and Structuring* and *Concrete Processing*, the negative influence of *Vocation-oriented* on *Critical Processing*, and the positive influence of *Ambivalent* on *Critical Processing*. Again, it is worth noting that the magnitude of many of the standardized regression coefficients in Table 5.32 is substantially reduced when variations in students' regulation strategies are controlled (and consequentially some of these coefficients become statistically non-significant), indicating the significant roles of students' regulation strategies in the indirect effects of students' mental models on their processing strategies.

In a number of the cases reported above, spurious effects have been identified, with the mental model *Construction of Knowledge* being a common cause of variations in the respective learning orientations and processing strategies of students. These findings suggest a minor omission in the theoretical model proposed in Richardson (2006, 2007), namely that spurious effects from the common cause (e.g., students' mental models) may not only be exercised via the direct routes, e.g. Paths A and G, but may also be exercised via the indirect routes, e.g. Path B $\rightarrow$ F (which was found in the present study) and Path B $\rightarrow$ C (which is also theoretically possible).

[23] Table 5.31 indicates that the possible sources of direct effect of students' mental models on *Concrete Processing* (via Path G) are from *Construction of Knowledge*, *Intake of Knowledge* and *Use of Knowledge*. As controlling for variations in students' regulation strategies only causes small or negligible changes in the respective standardized regression coefficients, any indirect effects exercised via Path B$\rightarrow$F should not be significant (see also Section 5.2.12). Table 5.29 confirms the direct effect of the above three mental models on *Self-test-oriented* and *Vocation-oriented* (via Path A).

Table 5.32 Standardized regression coefficients relating students' learning orientations to their processing strategies

Predictor Variable	Direct, Indirect and Spurious Effects[a]	Direct and Indirect Effects[b]	Direct Effects Only[c]
Relating and Structuring			
Personally Interested	**+0.155*****	**+0.106*****	+0.007
Certificate-oriented	**-0.193*****	**-0.166*****	**-0.072****
Self-test-oriented	**+0.210*****	**+0.167*****	+0.029
Vocation-oriented	-0.025	-0.044	+0.023
Ambivalent	+0.021	+0.022	+0.026
Critical Processing			
Personally Interested	**+0.172*****	**+0.126*****	+0.027
Certificate-oriented	**-0.156*****	**-0.128*****	-0.036
Self-test-oriented	**+0.181*****	**+0.139*****	+0.005
Vocation-oriented	**-0.112****	**-0.141*****	**-0.071****
Ambivalent	**+0.070****	**+0.072****	**+0.085*****
Memorizing and Rehearsing			
Personally Interested	+0.056	+0.025	-0.036
Certificate-oriented	-0.020	-0.028	+0.026
Self-test-oriented	**+0.174*****	**+0.137*****	+0.028
Vocation-oriented	**+0.092****	+0.060	+0.050
Ambivalent	-0.001	-0.015	-0.020
Analyzing			
Personally Interested	**+0.122*****	+0.077*	-0.010
Certificate-oriented	**-0.108****	**-0.093****	-0.018
Self-test-oriented	**+0.225*****	**+0.181*****	+0.038
Vocation-oriented	-0.021	-0.049	-0.031
Ambivalent	-0.014	-0.018	+0.016
Concrete Processing			
Personally Interested	**+0.159*****	**+0.082****	+0.014
Certificate-oriented	**-0.159*****	**-0.139*****	**-0.073****
Self-test-oriented	**+0.157*****	+0.092	-0.021
Vocation-oriented	**+0.145*****	+0.042	+0.061
Ambivalent	-0.020	-0.020	-0.029

[a] Not controlling for variations in students' mental models of learning and regulation strategies

[b] Controlling for variations in students' mental models of learning, but including any indirect effects mediated by students' regulation stratgies

[c] Controlling for variations in students' mental models of learning and regulation strategies

$^{*}p<0.05$, $^{**}p<0.01$, $^{***}p<0.001$ (two-tailed test)

5.2.14 Relationships between Students' Regulation Strategies and Students' Processing Strategies

Table 5.33 shows the standardized regression coefficients relating students' regulation strategies to their processing strategies. For *Relating and Structuring*, the effects of the two self-regulation strategies are basically direct, as indicated by the fact that the respective coefficients remain significant with magnitudes changed only slightly when variations in students' mental models and students' learning orientations are controlled. The effect of *Lack of Regulation* is also direct, but in view of the low magnitude of the coefficient concerned it is less important than those of the self-regulation strategies.

For *Critical Processing*, it was also found that the effects of the two self-regulation strategies are basically direct, as indicated by the fact that the respective coefficients remain significant with magnitudes changed only slightly when variations in students' mental models and students' learning orientations are controlled. After the said control of variations a direct effect of *External Regulation on Learning Results* is found, but it is less important than those of the self-regulation strategies, as indicated by the low magnitude of the coefficient concerned.

Relationships with *Memorizing and Rehearsing* are found in all the regulation strategies. Relationships with *Analyzing* are found in all the regulation strategies except *Lack of Regulation*; and relationships with *Concrete Processing* are found in all the regulation strategies except *External Regulation of Learning Processes*. Each of these relationships is basically a direct effect, as the respective coefficients remain significant with their magnitudes changed only slightly when variations in students' mental models and students' learning orientations are controlled.

Table 5.33 Standardized regression coefficients relating students' regulation strategies to their processing strategies

Predictor Variable	Direct, Indirect and Spurious Effects[a]	Direct and Indirect Effects[b]	Direct Effects Only[c]
Relating and Structuring			
Self-reg.: L. Proc. & Results	**+0.512*****	**+0.505*****	**+0.499*****
Self-reg.: L. Content	**+0.287*****	**+0.274*****	**+0.268*****
External Reg.: L. Processes	+0.025	+0.031	+0.035
External Reg.: L. Results	+0.002	+0.017	+0.019
Lack of Regulation	**+0.058****	**+0.067*****	**+0.062****
Critical Processing			
Self-reg.: L. Proc. & Results	**+0.472*****	**+0.471*****	**+0.463*****
Self-reg.: L. Content	**+0.319*****	**+0.308*****	**+0.296*****
External Reg.: L. Processes	-0.063*	-0.056*	-0.038
External Reg.: L. Results	+0.044	+0.054*	**+0.071****
Lack of Regulation	+0.042*	+0.048*	+0.020
Memorizing and Rehearsing			
Self-reg.: L. Proc. & Results	**+0.247*****	**+0.247*****	**+0.253*****
Self-reg.: L. Content	**+0.137*****	**+0.139*****	**+0.148*****
External Reg.: L. Processes	**+0.228*****	**+0.222*****	**+0.213*****
External Reg.: L. Results	**+0.178*****	**+0.175*****	**+0.163*****
Lack of Regulation	**+0.094*****	**+0.092*****	**+0.099*****
Analyzing			
Self-reg.: L. Proc. & Results	**+0.387*****	**+0.385*****	**+0.379*****
Self-reg.: L. Content	**+0.248*****	**+0.237*****	**+0.234*****
External Reg.: L. Processes	**+0.195*****	**+0.202*****	**+0.207*****
External Reg.: L. Results	**+0.142*****	**+0.154*****	**+0.158*****
Lack of Regulation	-0.017	-0.009	-0.014
Concrete Processing			
Self-reg.: L. Proc. & Results	**+0.381*****	**+0.328*****	**+0.326*****
Self-reg.: L. Content	**+0.176*****	**+0.182*****	**+0.179*****
External Reg.: L. Processes	+0.010	+0.012	+0.008
External Reg.: L. Results	**+0.218*****	**+0.211*****	**+0.208*****
Lack of Regulation	**+0.077*****	**+0.083*****	**+0.097*****

a Not controlling for variations in students' mental models of learning and learning orientations

b Controlling for variations in students' mental models of learning, but including any indirect effects mediated by students' learning orientations

c Controlling for variations in students' mental models of learning and learning orientations

*p<0.05, **p<0.01, ***p<0.001 (two-tailed test)

Overall, and as expected, the above findings suggest significant direct effects of students' regulation strategies on their processing strategies. When the magnitudes of the standardized regression coefficients are taken into account, the direct effects are mainly manifested in the positive influence of self-regulation strategies on Relating and Structuring, Critical Processing and Concrete Processing, and the positive influence of all regulation strategies except Lack of Regulation on Memorizing and Rehearsing and Analyzing.

5.2.15 Interim Discussion

The analytical approaches reported in Section 5.2.9 to Section 5.2.14 are relatively novel and the direct application of Richardson's model and analytical methodology for analyzing the ILS data has been fully justified. At this juncture, it is appropriate to summarize again the present findings and discuss the possibility of the causal links denoted by the individual paths of the model depicted in Figure 5.2, and to comment on Vermunt's model of regulation of constructive learning processes and its associated hypotheses.

For Path A of the model, the present findings (reported in Table 5.29) suggest significant effects of students' learning conceptions on their learning orientations. Direct effects of all the mental models except *Simulating Education* were found. Viewed from the magnitude of the standardized regression coefficients, the effects of *Use of Knowledge* on *Vocational-oriented* and of *Intake of Knowledge* on *Certificate-oriented* are the most salient, and these results are largely consistent with commonly held expectations. It is worth reiterating that the possibility for the existence of Path A was in fact not included in Vermunt's model. The present findings may therefore have potential to contribute to the field of research concerning the ILS, by proposing possible directions for the amendment of Vermunt's model, and certainly so in response contexts similar to that of the present study.

For Path B, the present findings (reported in Table 5.30) identify a direct effect of *Construction of Knowledge* on self-regulation strategies, and a direct effect of *Intake of Knowledge* on external regulation strategies. These findings are largely consistent with widely held views. To a lesser extent (i.e. in view of the magnitude of the standardized regression coefficient concerned), a direct effect of *Stimulating Education* on *External Regulation of Learning Results* (but not *External Regulation of Learning Processes*) is also found. It should be noted that *Use of Knowledge* and *Cooperative Learning* are found to have no effect on students' regulation strategies, which is a phenomenon deserving further exploration in future investigation.

For Path G, the present findings (reported in Table 5.31) suggest that the direct effects of students' mental models on their processing strategies are mostly not significant. These direct effects are mainly manifested in the negative influence of *Intake of Knowledge* and the positive influence of *Use of Knowledge* and *Construction of Knowledge* on *Concrete Processing.*

For Path E, the present findings (reported in Table 5.32) identify some direct effects of students' learning orientations on their processing strategies, as reported in Section 5.2.13. However, in view of the low magnitude of the standardized regression coefficients concerned, all these effects have only minor impact on the respective processing strategies of students.

For Path F, the present findings (reported in Table 5.33) suggest significant direct effects of students' regulation strategies on students' processing strategies, especially the positive influence of self-regulation strategies on *Relating and Structuring, Critical Processing* and *Concrete Processing. Memorizing and Rehearsing* is found as the common processing strategy adopted by all students, and *Analyzing* the common strategy adopted by most students except those failing to regulate their studies.

Finally, for Path C and Path D, the results in Table 5.27 and Table 5.28 suggest the possibility of genuine associations between students' learning orientations and their regulation strategies, although the low magnitude of most of the (partial) correlation coefficients concerned should be noted.

Further evidence for the causal efficacy of Path C comes from the effects of students' mental models on students' learning orientations that are mediated by their regulation strategies (i.e. via Path B $\rightarrow$ C), as manifested in the indirect component of the effect of *Stimulating Education* on *Self-test-oriented* (whose removal renders the effect concerned non-significant, see Table 5.29). However, viewed from the low magnitude of the indirect component, the impact of effects via Path C (if it exists) is small. Nevertheless, as the possibility for the existence of Path C is not included in Vermunt's model, the present findings may have the potential to contribute to the field of research concerning the ILS, by proposing possible directions for the amendment of Vermunt's model, and certainly so in response contexts similar to that of the present study.

Further evidence for the causal efficacy of Path D comes from the effects of students' mental models on their regulation strategies that are mediated by their learning orientations (i.e. via Path A $\rightarrow$ D). An example is the indirect component of the effect of *Intake of Knowledge* on *Self-regulation of Learning Processes and Results* (whose removal renders the effect concerned non-significant, see Table 5.30).

Overall, valuable insights have emerged. Apart from the possibility for the existence of Path A and Path C, Vermunt's model is found to apply also to the post-secondary education of Hong Kong, in the new response context of the present study. The present findings also confirm his hypothesis for the central role of regulation strategies, i.e. students' processing strategies are most directly determined by their regulation strategies, and the influence of students' mental models of learning and students' learning orientations on their processing strategies is mostly indirect, via students' regulation strategies. Moreover, through the demonstration of the indirect exercise of spurious effects via real-life examples (cf. Section 5.2.13), a minor omission in the models proposed by Richardson (2006, 2007) has been identified.

5.3 Exploration for Systematic Relationships Based on Effect Size

In Section 5.2, an investigation has been conducted to explore the possible systematic relationships among the relevant observables that are of interest in the present research, with the relative importance of identified effects being assessed (mainly) from the perspective of *statistical significance*. It should be noted that while the statistical significance of an effect is of theoretical importance, assessing the effect from the perspective of *effect size* is of practical importance and therefore also vital, as it is well known that an effect of very small size can still be statistically significant, an example in the present study is the coefficient of the correlation between *Analyzing* and *Appropriate Workload* (cf. Table 5.17), which has a value of only –0.07 but is significant at the 0.01 level.

The main purpose of this part of the present study is thus to review and further explore the possible systematic relationships among the relevant observables, and assess the size of the identified effects. To examine the relative importance of the present findings, they are compared with the results of other published work when deemed appropriate. As in Section 5.2, the presentation of the findings in this section is organized into two main parts: those concerning the relationships among the relevant constructs of student learning, and those concerning the relationships among the ILS components.

5.3.1 Effect Size of Relationships among Relevant Constructs of Student Learning

In reviewing the analysis results reported in Section 5.2.2 to Section 5.2.6, it should be noted that the size of these identified effects can be assessed by two means: the magnitude of (partial) correlation coefficients and the magnitude of standardized regression coefficients.

The examination of the size of the (partial) correlation coefficients in Table 5.18 reveals that while most of the 100 coefficients are of small magnitudes, 26 of them can be considered as representing effects of 'moderate' or 'large' size (i.e. with a magnitude of at least 0.3 or 0.5 respectively, cf. Cohen, 1992:157), with the associations between *Generic Skills* and students' mental models being the most salient. Overall, the results suggest that the effect of associations between the constructs in students' perceptions of the learning context and the constructs in students' learning patterns can range from 'small' to 'large', deserving further analyses.

The examination of the size of the standardized regression coefficients in Table 5.19 to Table 5.26 reveals that only those between *Good Teaching* and students' satisfaction with the programme exceed 0.3 (cf. Table 5.23), with the rest of the coefficients representing small or negligible effects.

As a matter of fact, it was also acknowledged by Richardson (2006) that many of the statistically significant associations found in his investigation (which is similar in nature to the present study) were relatively modest:

> Apart from the correlations between the students' perceptions and their approaches to studying (which are often substantial but have not been reported because of space limitations), only the associations between students' perceptions of receiving good materials and overall satisfaction would deserve to be described as more than 'small' effects according to the criteria proposed by Cohen.
>
> (Richardson, 2006: 890-891)

Nevertheless, Richardson was of the view that "the fairly modest effects found in these studies should be taken as a reminder of the amount of 'noise' or uncontrolled variation that bedevils work in this and many other areas of educational research" (p. 891). It is obvious that in terms of their order of magnitude, the present findings as summarized above closely resemble the results of Richardson (2006).

Since multiple regression analyses form the basis of investigation in the present study, it is advisable to also examine the *coefficient of determination* (R^2) derived from these analyses as a measure of effect size. It is well known that *multiple correlation* (R), i.e. the square root of the coefficient of determination, expresses the correlation between the dependent variable and all of the independent/predictor variables collectively (cf. p 306 of Bryman and Cramer, 2005/2006), and the magnitude of R^2 can be interpreted as the proportion of variation in the dependent variable that is explained by the regression model (cf. p118 of Field, 2000/2002). In fact, such kinds of analysis were reported in previous research into student learning, e.g. Vermunt (2005) which was a study of 792 students at a middle-size university in the Netherlands. A main objective for this part of the present study is to examine the size of the identified effects for the relationships among the relevant constructs via R^2, and to shed light on the interpretation of these results by comparing them with the counterparts in Vermunt (2005).

To be comparable with Vermunt's results, multiple regression analyses were conducted with students' demographic background (i.e. age, gender and prior qualification) and subject area comprising the set of predictor variables, and each of the ILS scales being the dependent variable. Unlike Vermunt (2005) which adopted the *total regression model* in its analyses (i.e. the reported R^2 represents the proportion of variance in the dependent variable that is explained by all the predictor variables), this part of the study adopted the *stepwise regression model* in its analyses (i.e. the reported R^2 represents the proportion of variance in the dependent variable that is explained by only the predictor variables whose entrance into the model is justified by tests of statistical significance). The author opines that this approach should better reflect the relationship between the dependent variable and the set of relevant predictor variables, as the contribution to R^2 from predictor variable(s) not justified from the perspective of statistical significance are excluded from the analyses. Consequently, stepwise regression model was adopted in all further analyses reported in Section 5.3.

The results of the study based on stepwise regression are summarized in Table 5.34.

Since similar analyses based on total regression were in fact conducted in the previous part of the present study (cf. Section 5.2), their results are summarized in Table 5.35 for comparison. It is obvious that the differences between the results obtained from the two approaches, in terms of R^2 and standardized regression coefficients, are in fact negligible.

The results of Vermunt (2005) are summarized in Table 5.36 for comparison with the present findings in Table 5.34. Viewed from the proportion of explained variance (i.e. the R^2 values) found in the two studies, it is obvious that students' demographic background and subject area serve as better predictors for most of the ILS scales in Vermunt's study than in the present study, as the latter results vary in a very narrow range of 1% (e.g. for *Certificate-oriented*) to 7% (e.g. for *External Regulations of Learning Results*), while the former results vary in a wider range of 2% (for *Stimulating Education*) to 21% (for *Certificate-oriented*). Part of the reason behind this phenomenon could be due to the different response contexts of the two studies, and the different operationalization of some predictor variables (e.g. age, prior qualification and subject area) for which the range in the present study was always narrower.

Table 5.34 Standardized regression coefficients of age, gender, prior qualification, and subject area as predictors of learning patterns based on the stepwise regression model (n = 1548), proportions of explained variance (R^2) by this model, F-values and significance levels

ILS Scale	Predictor									R^2	F
	Age	Gender	Prior Qualification	Subject Area							
				BABS	HOTO	LANG	IT	SOCSC	Others		
Processing Strategy:											
Relating and Structuring		-0.13^{***}					$+0.11^{***}$	$+0.05^{*}$		**0.04**	**8.62*****
Critical Processing		-0.17^{***}	$+0.06^{*}$			$+0.07^{*}$	$+0.12^{***}$			**0.05**	**10.75*****
Memorizing and Rehearsing				$+0.07^{*}$			$+0.12^{***}$			**0.04**	**10.81*****
Analyzing		-0.07^{**}					$+0.11^{***}$			**0.02**	**5.27*****
Concrete Processing		-0.11^{**}	$+0.07^{*}$	-0.17^{***}	-0.15^{***}					**0.05**	**10.78*****
Regulation Strategy:											
Self-reg.: L. Proc. & Results		-0.08^{**}					$+0.12^{***}$			**0.03**	**7.03*****
Self-reg.: L. Content	$+0.08^{**}$	-0.09^{**}		-0.14^{***}	-0.09^{*}		$+0.08^{*}$			**0.06**	**10.26*****
External Reg.: L. Processes			$+0.07^{*}$				$+0.08^{**}$			**0.02**	**5.98*****
External Reg.: L. Results	$+0.10^{**}$				-0.08^{**}		$+0.07^{*}$			**0.07**	**15.39*****
Lack of Regulation		-0.07^{*}			-0.07^{*}			-0.05^{*}		**0.02**	**3.66****
Mental Model of Learning:											
Construction of Knowledge	$+0.06^{*}$	$+0.09^{**}$	$+0.06^{*}$				$+0.08^{**}$		$+0.06^{*}$	**0.07**	**13.20*****
Intake of Knowledge		$+0.13^{***}$					$+0.07^{*}$		$+0.06^{*}$	**0.03**	**6.68*****
Use of Knowledge		$+0.08^{**}$	$+0.07^{*}$							**0.04**	**10.11*****
Stimulating Education		$+0.10^{***}$					$+0.07^{*}$	$+0.07^{**}$	$+0.06^{*}$	**0.04**	**7.80*****
Co-operative Learning	-0.07^{*}						$+0.10^{***}$		$+0.07^{*}$	**0.02**	**3.80*****
Learning Orientation:											
Personally Interested		$+0.10^{***}$		-0.14^{***}						**0.03**	**6.73*****
Certificate-oriented		$+0.10^{***}$								**0.01**	**3.23****
Self-test-oriented		$+0.07^{*}$						$+0.07^{**}$		**0.03**	**6.55*****
Vocation-oriented		$+0.16^{***}$							$+0.07^{**}$	**0.06**	**16.84*****
Ambivalent			-0.09^{**}				$+0.06^{*}$			**0.01**	**3.30****

Subject area: BABS - Business Administration/Business Studies; HOTO- Hospitality /Tourism; LANG - Language Studies; IT - Information Technology; SOCSC - Social Science

* p<0.05; ** p<0.01; *** p<0.001 (two-tailed test)

Table 5.35 Standardized regression coefficients of age, gender, prior qualification, and subject area as predictors of learning patterns based on the total regression model (n = 1548), proportions of explained variance (R^2) by this model, F-values and significance levels

ILS Scale	Predictor									R^2	F
	Age	Gender	Prior Qualification	Subject Area							
				BABS	HOTO	LANG	IT	SOCSC	Others		
Processing Strategy:											
Relating and Structuring		-0.14***					+0.13***	+0.06*		**0.04**	**5.89*****
Critical Processing		-0.17***	+0.07*			+0.07**	+0.13***			**0.06**	**7.47*****
Memorizing and Rehearsing							+0.07*			**0.04**	**5.86*****
Analyzing		-0.08**					+0.10**			**0.02**	**3.02*****
Concrete Processing		-0.11***	+0.07*			+0.06*	+0.13***	+0.11***	+0.07*	**0.06**	**7.45*****
Regulation Strategy:											
Self-reg.: L. Proc. & Results		-0.08**					+0.12***			**0.03**	**4.17*****
Self-reg.: L. Content	+0.08**	-0.09**				+0.08**	+0.19***	+0.06*		**0.06**	**7.85*****
External Reg.: L. Processes							+0.06*	-0.06*		**0.03**	**3.62*****
External Reg.: L. Results	+0.10**				-0.08**		+0.06*			**0.07**	**9.39*****
Lack of Regulation		-0.06*						-0.06*		**0.02**	**2.66****
Mental Model of Learning:											
Construction of Knowledge		+0.09**	+0.07*				+0.10**		+0.07*	**0.07**	**10.27*****
Intake of Knowledge		+0.13***					+0.06*		+0.06*	**0.03**	**4.05*****
Use of Knowledge		+0.09**	+0.07*							**0.04**	**5.74*****
Stimulating Education		+0.10***						+0.06*	+0.06*	**0.04**	**5.52*****
Co-operative Learning	-0.07*						+0.12***		+0.07*	**0.02**	**2.82****
Learning Orientation:											
Personally Interested		+0.10***			+0.12***	+0.08**	+0.13***	+0.08**	+0.10**	**0.03**	**4.05*****
Certificate-oriented		+0.11***								**0.02**	**1.89***
Self-test-oriented		+0.08**						+0.09**		**0.03**	**3.77*****
Vocation-oriented		+0.15***							+0.07*	**0.07**	**9.08*****
Ambivalent			-0.09**							**0.02**	**1.98***

Subject area: BABS - Business Administration/Business Studies; HOTO- Hospitality /Tourism; LANG - Language Studies; IT - Information Technology; SOCSC - Social Science

* p<0.05; ** p<0.01; *** p<0.001 (two-tailed test)

Table 5.36 Standardized regression coefficients of age, gender, prior qualification, and subject area as predictors of learning patterns based on the total regression model (n = 792), proportions of explained variance (R^2) by this model, F-values and significance levels, adapted from Vermunt (2005)

ILS Scale	Predictor									R^2	F
			Prior	Subject Area							
	Age	Gender	Qualification	M.I.S.	Econo	Ecotry	Socio	Psycho	Arts		
Processing Strategy:											
Relating and Structuring	+0.11*		+0.09*	+0.09*		-0.12*			+0.06	**0.08**	**6.9*****
Critical Processing	+0.19***	-0.14***			-0.10*	-0.09	+0.06	+0.09	+0.13**	**0.12**	**10.6*****
Memorizing and Rehearsing	-0.06		-0.11*		-0.11*			-0.06	-0.06	**0.04**	**2.9****
Analyzing		-0.09*	-0.11**		-0.09		-0.11*	-0.19***	-0.15**	**0.08**	**7.1*****
Concrete Processing	+0.15***	-0.11**				-0.17***		+0.11*		**0.11**	**9.7*****
Regulation Strategy:											
Self-reg.: L. Proc. & Results	+0.10*	-0.06						+0.15**		**0.06**	**4.7*****
Self-reg.: L. Content	+0.35***	-0.09*				-0.08				**0.14**	**12.5*****
External Reg.: L. Processes			-0.11*	-0.06	-0.06	-0.06		-0.23***	-0.18***	**0.05**	**4.1*****
External Reg.: L. Results		+0.14***	-0.07	+0.16***	+0.20***	+0.22***		-0.14**	-0.15***	**0.15**	**14.2*****
Lack of Regulation	+0.16***		-0.15***	+0.09*	+0.10*	+0.11*	+0.06	+0.08		**0.03**	**2.4***
Mental Model of Learning:											
Construction of Knowledge	+0.27***	+0.08*			-0.08	-0.11*				**0.14**	**12.7*****
Intake of Knowledge		+0.06	-0.22***			+0.09*	-0.07	-0.15**	-0.11*	**0.13**	**12.1*****
Use of Knowledge						-0.11*	-0.09	-0.17**	-0.16***	**0.04**	**3.0****
Stimulating Education	+0.07	+0.07	-0.09		+0.06	+0.11*	+0.07			**0.02**	**1.7**
Co-operative Learning		+0.18***	-0.09*	+0.10*	+0.14**	+0.20***	+0.09			**0.07**	**5.6*****
Learning Orientation:											
Personally Interested	+0.15***	+0.07	-0.07		+0.06		+0.06	+0.20***	+0.18***	**0.11**	**9.4*****
Certificate-oriented	-0.15***	-0.15***	-0.07				-0.15**	-0.26***	-0.21***	**0.21**	**20.8*****
Self-test-oriented										**0.01**	**0.6**
Vocation-oriented		-0.07				-0.11*	-0.19***	-0.07	-0.20***	**0.06**	**5.5*****
Ambivalent		+0.08*	-0.08		+0.12*	+0.19***	+0.08			**0.05**	**3.8*****

Subject area: M.I.S - Management Information Science; Econo - Economy; Ecotry - Econometry; Socio - Sociology; Psycho - Psychology

* p<0.05; ** p<0.01; *** p<0.001 (two-tailed test)

Nevertheless, the 20% difference in explained variance (i.e. 21% vs. 1%) between the two studies in the regression of *Certificate-oriented* is worthy of further examination. From the standardized regression coefficients, it can be seen that in the present study students' subject areas made no contribution to R^2 (possibly due in part to more homogeneity in the participating students' certificate-orientations, which was largely unaffected by the disciplines being examined in the study). However, in Vermunt's study students' subject areas assumed a relatively important role in predicting their certificate-orientations, as students who studied Psychology, Arts or Sociology were found to be less *Certificate-oriented* than the other students. Vermunt also found older students to be less *Certificate-oriented*, whereas in the present study students' age had no identified effect (possibly due in part to the narrower age range of the students participating in the study). It is also interesting to note that while male students were found to be more *Certificate-oriented* by Vermunt, contrary results were found in the present study.

Overall, the present findings indicate that the predictive power of students' demographic background (and subject area) on students' learning patterns are low. It is unfortunate that corresponding R^2 values were not reported in Richardson (2006) for crosschecking; however, judging from the similar order of magnitude of the standardized regression coefficients reported in that study and the present study, it is very likely that the respective R^2 values in Richardson (2006) were also low, i.e. that study also found low predictive power of students' demographic background on their study behaviors.

Besides personological factors such as students' demographic background and *more general contextual factors* such as subject area (whose predictor power for students' learning patterns are low, as demonstrated above), it is appropriate to examine the predictive power of other relevant observables. An obvious candidate is students' perceptions of the learning context (as measured by the revised CEQ), which represent *more specific contextual factors* that may affect students' learning patterns. Apart from these constructs, the present study also investigated the possible influence of the following factors:

- Difficulty level of the programme as perceived by students, which is measured by an instrument item with scores ranging from 1 (denoting *Very Easy*) to 5 (denoting *Very Difficult*)

- Students' level of interest in the programme, which is measured by an instrument item in the reversed sense, with scores ranging from 1 (denoting *Very High*) to 5 (denoting *Very Low*)

- Students' expected performance in the programme, which is measured by an instrument item in the reversed sense, with scores ranging from 1 (denoting *Very Good*) to 5 (denoting *Very Poor*)

It should be noted that in this part of the study, expected performance was not interpreted as an indicator of learning outcome (cf. Section 5.2), but a somewhat personal factor reflecting students' self efficacy that may influence their learning patterns.

The results of this investigation are summarized in Table 5.37, with the left-hand side showing the effects of students' perceptions, and the right-hand side showing the effects of the other factors[24]. Viewed from the proportion of explained variance (i.e. the R^2 values), it is obvious that *students' perceptions* (representing more specific contextual factors) have a greater influence on students' learning patterns than *subject area* (representing a more general contextual factor).

For students' processing strategies, the influence of students' perceptions can be considered as mostly 'small'[25], with the R^2 values ranging from 5% (for *Critical Processing*) to 14% (for *Concrete Processing*). For students' regulation strategies, the influence can be considered as 'small', with the R^2 values ranging from 6% (for *Self-regulation of Learning Content*) to 12% (for *External Regulation of Learning Results*). For students' mental models, the influence can be considered as mostly 'large', with the R^2 values ranging from 20% (for *Co-operative Learning*) to 34% (for *Construction of Knowledge*). For students' learning orientations, the influence can be considered as 'moderate', with the R^2 values ranging from 14% (for *Certificate-oriented*) to 24% (for *Self-test-oriented* and *Vocation-oriented*).

It is interesting to note that the possible influence of students' perceptions have more impact on the *passive* components (i.e. students' mental models and learning orientations) than the *active* components (i.e. students' processing and regulation strategies) of students' learning patterns. Viewed from the magnitude of the standardized regression coefficients, the effects of *Generic Skills* on students' learning patterns are the most salient; this phenomenon further justifies the incorporation of this scale into the instrument when the CEQ was revised from CEQ30 to CEQ36 (cf.

[24] As level of interest and expected performance are measured in the reversed sense by the research instrument, the sign of the respective standardized regression coefficients was reversed before reporting.

[25] Following the suggestion of Cohen (1992:159), an R value of at least 0.14, 0.36 and 0.51 (and consequently an R^2 value of at least 0.02, 0.13 and 0.26) is considered as representing a 'small', 'moderate' and 'large' effect respectively.

Section 3.2.1). It is thought provoking to find that *Good Teaching* had no effect on students' processing strategies, and only 'moderate' effect on students' external regulation strategies. The consistently negative effect of *Appropriate Assessment* found in the present study should be noted, and should be subject to further exploration in future investigation.

Viewed from the proportion of variance (i.e. the R^2 values) explained by the other factors, it is obvious that all of them represent 'small' effects or no effect at all, with results ranging from 0% (for *Intake of Knowledge*) to 8% (for *Ambivalent*). The possible effects of these factors on students' learning patterns as reflected in the magnitude of the standardized regression coefficients are also 'small', and comparable to those of students' demographic background (and subject area).

Despite its small effect size, the generally positive influence of *students' level of interest in the programme* on students' learning patterns is noteworthy. It is also interesting to note that the *difficulty level of the programme as perceived by students* (slightly) discourages students' adoption of deep learning approach (cf. negative coefficients for *Relating and Structuring*, *Critical Processing* and *Self-Regulation of Learning Processes and Results*), but encourages students' undirected learning approach (cf. positive coefficients for *Lack of Regulation* and *Ambivalent*). On the other hand, *students' expectation of high performance in the programme* is (slightly) more associated with their adoption of surface learning approach (cf. positive coefficients for *Memorizing and Rehearsing*, *Analyzing* and the two external regulation strategies).

Table 5.37 Standardized regression coefficients of revised CEQ scales and other factors respectively as predictors of learning patterns based on the stepwise regression model, and significance levels of the F-values

ILS Scale	Revised CEQ Scale							Other Factor				
	AA	AW1	GS	GT	IN1	R^2	F	DL	IN	EP	R^2	F
Processing Strategy:												
Relating and Structuring	-0.05*		+0.16***		+0.12***	**0.07**	**40.42*****	-0.09***	+0.17***		**0.04**	**32.35*****
Critical Processing	-0.09**		+0.10**		+0.12***	**0.05**	**27.59*****	-0.09***	+0.08**		**0.02**	**13.11*****
Memorizing and Rehearsing	-0.09**		+0.24***			**0.08**	**64.11*****		+0.13***	+0.08**	**0.03**	**25.40*****
Analyzing	-0.06*		+0.19***		+0.11***	**0.08**	**45.26*****	-0.06*	+0.15***	+0.06*	**0.04**	**23.21*****
Concrete Processing			+0.38***			**0.14**	**261.49*****	-0.08**	+0.25***		**0.07**	**60.86*****
Regulation Strategy:												
Self-reg.: L. Proc. & Results	-0.08**		+0.21***		+0.09**	**0.09**	**53.33*****	-0.08**	+0.17***	+0.07**	**0.06**	**30.10*****
Self-reg.: L. Content		-0.07**	+0.12***		+0.15***	**0.06**	**36.00*****		+0.19***		**0.04**	**59.24*****
External Reg.: L. Processes	-0.08**		+0.21***	+0.14***		**0.11**	**65.57*****		+0.17***	+0.13***	**0.06**	**50.63*****
External Reg.: L. Results	-0.09**		+0.28***	+0.11**	-0.09**	**0.12**	**51.75*****		+0.15***	+0.09**	**0.04**	**32.00*****
Lack of Regulation	-.015***	-.016***				**0.07**	**57.84*****	+0.09***			**0.01**	**12.42*****
Mental Model of Learning:												
Construction of Knowledge	-0.14***		+0.42***	+0.11***	+0.07*	**0.34**	**202.61*****		+0.20***	+0.06*	**0.05**	**41.89*****
Intake of Knowledge	-0.32***	-0.06**	+0.24***	+0.10***		**0.26**	**139.71*****	---	---	---	**0.00**	**---**
Use of Knowledge	-0.23***		+0.46***	+0.08**	-0.10***	**0.32**	**185.08*****	+0.06*	+0.11***	+0.07**	**0.02**	**12.55*****
Stimulating Education	-0.22***		+0.40***	+0.12***		**0.33**	**255.63*****		+0.14***	+0.09**	**0.04**	**29.40*****
Co-operative Learning	-0.18***	-0.15***	+0.11***	+0.13***	+0.12***	**0.20**	**80.31*****		+0.10***		**0.01**	**14.93*****
Learning Orientation:												
Personally Interested	-0.13***		+0.23***	+0.09**	+0.16***	**0.21**	**103.34*****	-0.09***	+0.20***		**0.05**	**43.41*****
Certificate-oriented	-0.22***	-0.12***	+0.09**	+0.13***		**0.14**	**64.59*****	+0.10***	-0.06*	+0.10**	**0.02**	**8.37*****
Self-test-oriented	-0.15***		+0.32***	+0.08**	+0.10***	**0.24**	**125.18*****		+0.17***	+0.08**	**0.05**	**36.97*****
Vocation-oriented	-0.14***	+0.06*	+0.44***			**0.24**	**160.86*****		+0.18***	+0.08**	**0.05**	**39.29*****
Ambivalent	-0.26***	-0.26***	-0.20***	+0.12***		**0.18**	**83.93*****	+0.09***	-0.22***	-0.08**	**0.08**	**46.48*****

Revised CEQ Scale: GT – Good Teaching, AW1 – Appropriate Workload, AA – Appropriate Assessment, IN1 – Emphasis on Independence, GS – Generic Skills

Other factor: DL - Difficulty Level, IN - Interest in Programme, EP - Expected Performance

* $p<0.05$; ** $p<0.01$; *** $p<0.001$ (two-tailed test)

Overall, the present findings indicate that among the predictor variables investigated in the present study, students' perceptions of the learning context (which are in theory alterable by the teaching and learning arrangements) have the most salient impact on students' learning patterns. This phenomenon conforms to the results of previous research, and has positive implications in terms of attempting to improve educational quality through innovations in teaching and learning. However, the impact of students' perceptions found in the present study is stronger on the *passive* than the *active* components of students' learning patterns, and such a finding leads to an interest in investigating the size of effects among the components of students' learning patterns, which is reported in the next subsection.

5.3.2 Effect Size of Relationships among the ILS Components

In reviewing the analysis results reported in Section 5.2.9 to Section 5.2.14, it should be noted that the size of these identified effects can be assessed by two means: the magnitude of (partial) correlation coefficients and the magnitude of standardized regression coefficients.

The examination of the size of the (partial) correlation coefficients in Table 5.28 reveals that of the 25 coefficients, only the effect of the correlation between *Ambivalent* and *Lack of Regulation* can be considered as reaching the level of 'moderate' size, with the rest of the coefficients representing 'small' effects or no effect at all. Overall, the results suggest that the effect of associations between constructs in students' learning conceptions and constructs in students' learning orientations are mostly 'small'.

In examining the size of the standardized regression coefficients in Table 5.29 to Table

5.34, it is revealed that the identified effects which can be considered as 'moderate' include the associations between *Intake of Knowledge* and *Certificate-oriented* and the associations between *Use of Knowledge* and *Vocation-oriented* (cf. Table 5.29), as well as a number of associations between constructs in students' regulation strategies and constructs in students' processing strategies (cf. Table 5.33), with the effect of the associations between *Self-regulation of Learning Processes and Results* and *Relating and Structuring* reaching the level of 'large' size. Overall, the results suggest that the effect of these associations can range from 'small' to 'large', deserving further investigation.

The relationships among the ILS components can also be assessed by examining the coefficient of determination (R^2) derived from multiple regression analyses as a measure of effect size. In fact, such kinds of analysis were reported in previous research into student learning, e.g. Boyle *et al.* (2003) which was a study of 156 university students in the UK context. A main objective for this part of the present study is to conduct similar analyses for post-secondary students in the Hong Kong context, and to shed light on the interpretation of these results by comparing them with the counterparts in the study of Boyle's group.

To be comparable with the results of Boyle's group, two multiple regression analyses were conduced. In the first analysis, each of the processing strategies was set as the dependent variable, with the regulation strategies, mental models and learning orientations serving as the predictor variables. In the second analysis, each of the regulation strategies was set as the dependent variable, with the mental models and learning orientations serving as the predictor variables. A *stepwise regression model* was adopted in these analyses, which is the same approach as reported in Boyle *et al.*

(2003).

Table 5.38 shows the results of the first analysis and compares them to the results of Boyle's group. For the present study, a 'large' proportion of the variance in students' processing strategies was explained by the regression model, as indicated by the R^2 values which ranged from 48% (for *Memorizing and Rehearsing*) to 61% (for *Analyzing*). In general, the effects found in the present study were more salient than those found by Boyle's group, in which the R^2 values ranged from 29% (for *Memorizing and Rehearsing*) to 56% (for *Critical Processing*).

Similar analyses based on total regression were in fact conducted in the previous part of the present study (cf. Section 5.2) and can be used for comparison. It is obvious that these results as shown in Table 5.31 for relationships between students' mental models and students' processing strategies (in the row for *variations in LO and RS scores being controlled*), Table 5.32 for relationships between students' learning orientations and students' processing strategies (in the column for *direct effects only*), and Table 5.33 for relationships between students' regulation strategies and students' processing strategies (in the column for *direct effects only*) are largely consistent with the findings in Table 5.38. As a result, the observations as reported in Section 5.2.12 to Section 5.2.14 are still largely relevant for describing the findings reported in this subsection.

Table 5.39 shows the results of the second analysis and compares them to the results of Boyle's group. For the present study, a 'small' to 'moderate' proportion of the variance in students' regulation strategies was explained by the regression model, as indicated by the R^2 values which ranged from 12% (e.g. for *Lack of Regulation*) to 16% (for *Self-regulation of Learning Processes and Results*). In general, the effects found in the present study were less salient than those found by Boyle's group, in which the R^2 values ranged from 16% (for *External Regulation of Learning Processes*) to 30% (for *Lack of Regulation*).

Similar analyses based on total regression to investigate the relationships between students' mental models and students' regulation strategies, as reported in Table 5.30 (in the column for *direct effects only*), are used for comparison. Again, it is obvious that those results are largely consistent with the findings in Table 5.39 and therefore the observations as reported in Section 5.2.11 are still largely relevant for describing the findings reported in this subsection.

Overall, it can be seen that in the present study, the influence on students' processing strategies was dominated by students' regulation strategies, and in most cases the effects of the other two ILS components were not salient when variations in students' regulation strategies were controlled by the regression model, suggesting that they were mostly indirect effects mediated by students' regulation strategies. To a moderate extent, each of the students' regulation strategies was affected by various constructs in students' mental models and students' learning orientations, the most salient effects being between *Construction of Knowledge* and *Self-regulation of Learning Processes and Results*, and between *Ambivalent* and *Lack of Regulation*. All these findings are largely consistent with previous research, and they confirm again Vermunt's hypothesis from the perspective of explained variance manifested as the R^2 values.

Table 5.38 Standardized regression coefficients of regulation strategies, mental models of learning and learning orientations as predictors of processing strategies based on the stepwise regression model, and significance levels of the F-values

Processing strategies	Relating & Structuring		Critical Processing		Memorizing & rehearsing		Analyzing		Concrete Processing	
	BDD	PS	BDD	PS	BDD	PS	BDD	PS	BDD	PS
Regulation strategies										
Self-regulation of										
Learning processes & results	*+0.38*	+0.52***	*+0.51*	+0.49***	*+0.18*	+0.26***	*+0.26*	+0.40***	*+0.31*	+0.20***
Learning content	*+0.12*	+0.30***	*+0.20*	+0.33***		+0.13***		+0.24***	*+0.16*	+0.33***
External regulation of										
Learning processes			*-0.17*		*+0.43*	+0.22***	*+0.19*	+0.20***	*-0.19*	
Learning results	*+0.23*		*+0.23*			+0.18***	*+0.35*	+0.13***	*+0.17*	+0.20***
Lack of regulation		+0.07***				+0.10***				+0.08***
Mental models										
Construction of knowledge							*+0.17*			+0.07**
Intake of knowledge	*-0.21*			-0.05*						-0.11***
Use of knowledge							*-0.15*	-0.06**	*+0.31*	+0.17***
Stimulating education	*+0.19*				*+0.15*					
Co-operative learning										
Learning orientations										
Personally interested						-0.04*			*+0.18*	
Certificate-oriented		-0.06***								-0.09***
Self-test-oriented										
Vocation-oriented			*-0.14*	-0.08***		+0.08***			*-0.18*	+006*
Ambivalent				+0.09***			*-0.15*		*-0.12*	
R^2	***0.49***	**0.60**	***0.56***	**0.55**	***0.29***	**0.48**	***0.44***	**0.61**	***0.50***	**0.54**
F	***40.5***	**590.7*****	***56.9***	**388.3*****	***30.5***	**207.3*****	***30.5***	**494.7*****	***32.5***	**203.5*****

BDD = study of Boyle, Duffy & Dunleavy (2003); n = 156; information on test of statistical significance was not provided

PS = present study; n = 1572; * p<0.05; ** p<0.01; *** p<0.001 (two-tailed test)

Table 5.39 Standardized regression coefficients of mental models of learning and learning orientations as predictors of regulation strategies based on the stepwise regression model, and significance levels of the F-values

Regulation Strategies	Self-regulation of learning processes and results		Self-regulation of learning content		External regulation of learning processes		External regulation of learning results		Lack of regulation	
	BDD	PS	BDD	PS	BDD	PS	BDD	PS	BDD	PS
Mental models										
Construction of knowledge	+0.33	+0.29***	+0.25	+0.23***		+0.14***		+0.09**		
Intake of knowledge	-0.23		-0.16		+0.32	+0.15***	+0.16	+0.09**	+0.14	+0.08**
Use of knowledge	+0.13			-0.08*					+0.19	+0.08**
Stimulating education	+0.16		+0.21				+0.17	+0.09*		
Co-operative learning			-0.13							
Learning orientations										
Personally interested		+0.12***		+0.20***						
Certificate-oriented		-0.14***		-0.14***	+0.19		+0.14			
Self-test-oriented		+0.18***		+0.13***		+0.09**	+0.15	+0.10**		
Vocation-oriented		-0.11***		-0.13***		+0.10**		+0.13***		
Ambivalent			-0.19		-0.12		-0.26		+0.46	+0.29***
R^2	**0.27**	**0.16**	**0.26**	**0.12**	**0.16**	**0.14**	**0.16**	**0.15**	**0.30**	**0.12**
F	**24.4**	**59.1*****	**18.5**	**36.2*****	**16.3**	**61.3*****	**11.0**	**55.2*****	**34.1**	**72.8*****

BDD = study of Boyle, Duffy & Dunleavy (2003); n = 156; information on test of statistical significance was not provided
PS = present study; n = 1572; * $p<0.05$; ** $p<0.01$; *** $p<0.001$ (two-tailed test)

5.3.3 Interim Discussion

In Section 5.3, the strength of relationships between some factors which may affect student learning in the post-secondary education of Hong Kong is explored, using the magnitude of (partial) correlation coefficients, standardized regression coefficients and coefficients of determination as measures of effect size. Based on the data collected from the research instrument, the relationships between students' learning patterns (as operationalized by the ILS scales) with each of the following groups of factors are assessed:

- Students' demographic background (in terms of students' age, gender and prior qualifications) and a general contextual factor (i.e. students' subject areas)

- Students' perceptions of the learning context (as the specific contextual factors operationalized by the revised CEQ scales)

- Other factors such as students' interest and expected performance in their programmes, and the perceived difficulty of the programmes

Among all these factors, students' perceptions of the learning context are found to have the most significant influence on students' learning patterns (with most of their effects being of a 'medium' size), while the effects of the other factors being considered are mostly 'small'.

The strength of relationships between ILS components is also explored. All the findings are largely consistent with previous research, and they confirm the posited central explanatory role of regulation strategies in students' learning patterns, as hypothesized by Vermunt (1998).

At this juncture, some final remarks on the general theoretical model proposed by Richardson (2006, 2007) are offered, since it forms the basis of most of the investigation that has been conducted for the present study.

Through the experience of adapting the model for the present research, the author agrees that the adopted 'path analysis' techniques have the potential to "provide a powerful tool for revealing the underlying causal relationships among the various components of the general theoretical model" (Richardson, 2006:891). However, the model and its associated techniques are not free of constraints in their support for making causal inferences, as they are basically a clever way of organizing multiple regression analyses so that the relationships among the constructs being modeled can be delineated as *possible direct*, *indirect* or *spurious* effects through appropriate analyses of the standardized regression coefficients. However, since any investigation basing purely on this model is still a correlational study, the problem of causal ambiguity as mentioned in Section 3.6.4 cannot be completely avoided.

An example of the problem is shown in Figure 5.3, which uses the general theoretical model to investigate the relationships among the constructs denoted by boxes X1, X2, X3 and X4. In this example, if a significant association is found between X2 and X4, and the association is still significant when variations in both X1 and X3 are controlled, then it is inferred as a direct effect via Path E, as no source of indirect or spurious effect can be found *within the model*. However, the model may not be a sufficient representation of the real world, and it is possible that the association between X2 and

X4 is in fact a spurious effect exercised via Path H and Path I from the box X5, which is *exterior to the model.* As student learning is a complex phenomenon involving many constructs (cf. Figure 3.1), such a possibility for insufficiency of the model leading to incorrect causal inference needs to be acknowledged.

It should also be noted that the inferential power of the general theoretical model is in fact based on those of its constituent multiple regression analyses. As the coefficient of determination (R^2) of a multiple regression analysis denotes the proportion of explained variation in the dependent variable, when the value of R^2 is low, as in some cases reported in the present study and Richardson (2006), it means that a large proportion of the variation in the dependent variable remains unexplained by the model, and therefore the practical importance of the results basing on the regression (e.g. the direct, indirect or spurious effects inferred from the analyses of the standardized regression coefficients concerned) should be viewed with caution.

Nevertheless, despite the above-mentioned concerns, Richardson's general theoretical model is still found by the author to be a powerful exploratory tool in examining the possible relationships between the relevant constructs of student learning and the ILS components in the present study. It has in fact enabled the author to identify the *possible* direct, indirect and spurious effects among the observables concerned, and to make explicit the issues whose further exploration in future investigation may be worthwhile.

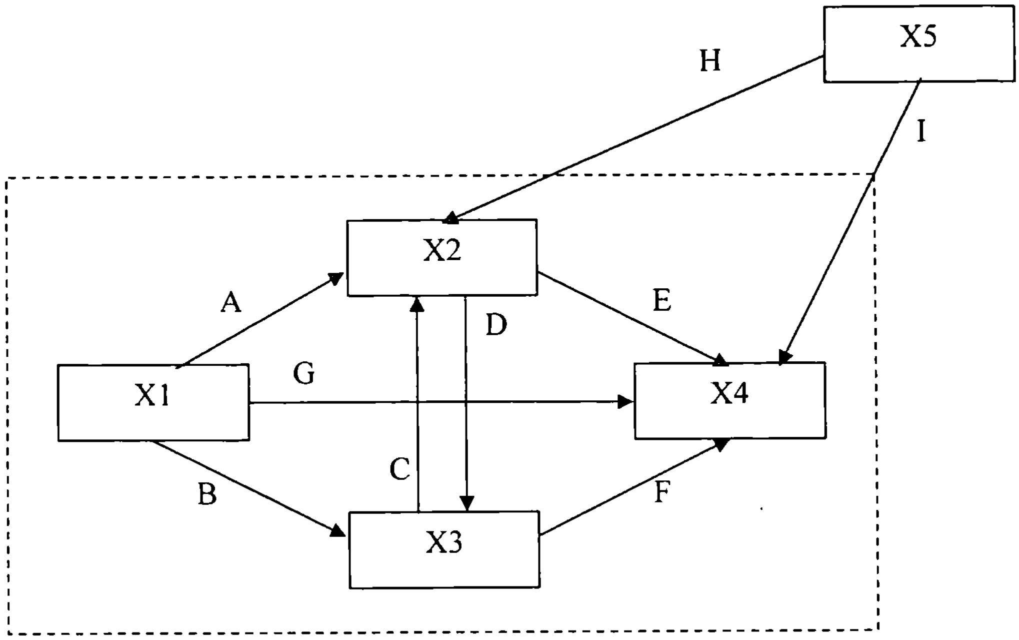

Figure 5.3 A Possibility for Causal Ambiguity in Richardson's General Theoretical Model

This final chapter of the thesis summarizes the findings of the research undertaken and presents conclusions about the applicability of the composite research instrument adapted for the new response context of post-secondary education in Hong Kong. It also reviews the background of the present research, and briefly discusses the possible implications for the quality endeavor in terms of both the internal quality assurance (QA) processes practiced by educational institutions and external quality monitoring (EQM) conducted by QA agencies. Finally, the chapter ends with a discussion of the research methodology used in the present study, and possible directions for future development.

6.1 Background of the Present Study

A driving force for the author to conceive the present study was the rapid expansion of post-secondary education in Hong Kong during the past few years, which has caused the premature achievement of the participation rate in the relevant age cohort of students targeted by the Hong Kong Special Administrative Region (HKSAR) Government. This expansion has furthermore resulted in fierce competition among the programme providers (in particular those in the sub-degree sector), and rendered it necessary to urgently address the 'quality vs. quantity' issues of the academic provisions concerned. The platform for the research undertaken was set in the non-degree part of the post-secondary education system, the major programme types of which are Associate Degree, Higher Diploma, Certificate, Diploma and Project Yi Jin. These programmes are generally considered by the Hong Kong society as 'alternative routes' for the development of secondary school leavers, and are viewed by many as 'inferior choices' in comparison to the limited senior secondary places that aim to prepare students for admission to universities. Moreover, many students of these programmes may have learning problems brought over from their secondary education, thereby creating a need for particular attention to the quality of their educational experiences.

Another driving force for the present study was the author's concern about the current status of the quality endeavor being practiced in the post-secondary education system of Hong Kong, in terms of both the internal QA processes and the various EQM approaches, which largely resemble their counterparts in the higher education system. The recent implementation of the Qualifications Framework (QF), through its associated QA mechanisms, may have the potential to reduce the complexity of the current EQM practice in Hong Kong, thus affecting also the internal QA processes. However, basing the EQM practice on the QF also tends to emphasize the vocational relevance of education and students' operational competence for the world of work, resulting in a danger of insufficient attention being paid to the quality of teaching and learning (on the part of both educational institutions and QA agencies), which is in fact of paramount importance for post-secondary students.

6.1.1 The Pursuit of Educational Quality

There is now consensus that the nature of educational quality is contestable, and that there is always a tension between accountability and improvement in the quality endeavor. From a pragmatic perspective, the currently dominant QA approaches such as EQM and performance indicators, despite various criticisms, have in fact their respective reasons for existence. However, it is also undeniable that the overall quality culture within the post-secondary education system of Hong Kong, as currently manifested, tends to favor the institutional aspects rather than the student aspects of the quality issues, and tends to lean more on the accountability end rather than the improvement end of the quality spectrum. The present study has thus explored practical means to help shift the focus of the quality endeavor towards the improvement end of the spectrum, with *the student experience* as the central guiding principle.

In view of the complexity of an education system, there is no single authoritative approach for assuring the quality of teaching and learning. Nevertheless, a practical way forward lies in the appropriate design and utilization of quantitative instruments to externalize relevant student experiences. Resultant data can enable educational institutions and QA agencies to monitor the quality of the academic provisions concerned, and also enable teachers to reflect on their educational beliefs, values and practices.

The use of quantitative instruments such as inventories or questionnaires for such purposes is in fact not new. However, as currently practiced by most educational institutions, the design of such instruments typically lacks the required psychometric rigor, thereby jeopardizing the credibility of the collected data for informing the quality endeavor. The present study has therefore advocated the development of an evidence-based, research-informed, and enhancement-led approach to collecting and using students' feedback. An important part of this approach emphasized in the present study is to establish, through empirical research, the *validity* and *reliability* of instruments before they are used for data collection.

Within the broad range of student feedback that can be collected and utilized, the author opines that the focus should be placed on those relevant aspects of student learning as considered by many to be the 'heart of quality' in education and training and, in particular, also of importance for the post-secondary education in Hong Kong. The complexity of the phenomena related to student learning renders the need for a practical investigative project to address only a limited set of constructs as the explanatory sources of commonality and variation among students. The major constructs selected for investigation include students' perceptions of the learning context and students' learning patterns (which comprise cognitive, regulative, metacognitive and motivational components), as operationalized in the scales of the composite research instrument employed in the present study.

6.1.2 Uniqueness of the Present Study

The comprehensive design of an instrument for collecting student feedback typically adopts a two-step approach that involves lengthy processes in the development of item stems from qualitative studies, and in the psychometric development of these items. Adopting such an approach in the purest sense was beyond the scope of the present study, and the author has therefore decided to exploit the results of published work in adapting appropriate instruments that have been validated in the other contexts. In this regard, the Course Experience Questionnaire (CEQ) and the Inventory of Learning Styles (ILS) were selected for adaptation to derive a composite instrument for the present study. The CEQ was developed in the UK higher education sector and has been used in the national graduate survey of Australia since 1993. The ILS was developed in the Dutch higher education sector and has been widely used in a number of studies, mainly in western contexts. To the knowledge of the author, both instruments have never been used in the post-secondary education system of Hong Kong. By utilizing a Chinese translation of the two instruments in a new and previously unreported context, the present study was able to extend the student learning research literature involving the CEQ and the ILS.

Although there is a practical limit on the range of constructs that can form the basis of a single project, the present study was in fact able to use a more integrative approach than most other published work to investigate the interactions of the relevant learning components in real-life settings, mainly through the constructs operationalized by the CEQ scales and the ILS scales. It can therefore be viewed as a response to the need expressed by some researchers (e.g., Salomon, 1995; Pintrich, 2000a) for examining composites of different cognitive, motivational, and social components and investigating their multiplicative interactions, so as to broaden the research agendas and to improve our understanding of the complexity of student learning.

The methodology for analyzing data collected by quantitative instruments is post-hoc and correlational in nature, and is subject to various limitations such as causal ambiguity. Nevertheless, by adopting the general theoretical model of Richardson (2006, 2007) to inform the interpretation of the regression analyses of the CEQ and ILS data, the present study was able to delineate the relationships among the constructs being modeled as *possible direct*, *indirect* or *spurious* effects through appropriate comparisons of the standardized regression coefficients. It is noteworthy that Vermunt's (1998) model of 'regulation of constructive learning processes', which posits the central role of regulation strategies between the ILS components, is embedded in Richardson's model. In analyzing the ILS data via Richardson's model, the present study has confirmed Vermunt's theoretical position in its empirical manifestation in a post-secondary Hong Kong response context, and is believed to be the first to thus analyze the relationships between the ILS components.

The present study also systematically explores the relationships between the constructs of interest from two complementary perspectives: the *statistical significance* of an effect (which is of theoretical importance) and the *size* of an effect (which is of practical importance). And where possible, analysis results of the present study have been compared to, and been found to be largely consistent with, the results of other published work.

6.2 Major Conclusions from the Present Research

In this section, the major research findings and conclusions are summarized for easy reference.

6.2.1 Applicability of the Adapted Instrument for Local Research

Although the CEQ has a long development history in the western higher education context and has been used in the national graduate survey of Australia since 1993, the present study found strong cultural effects in its adaptation to the local context of post-secondary education in Hong Kong. This finding has made it clear that there is a need to further develop the CEQ-portion of the composite research instrument if it is to be used in future investigation conducted in this context. An obvious problem encountered in the present study is the disappointingly low reliability of *Clear Goals and Standards*, noting that relatively high alpha values for this scale have been reported in the other studies. Furthermore, in future revision of the CEQ-portion of the instrument, the construct denoted by this scale should not be adapted directly from the original context, but should be developed by a more fundamental means such as the derivation of key issues to be measured from qualitative studies conducted in the local context.

In broader terms the findings as reported in Section 5.1.2 constitute initial evidence for arguing that students pursuing programmes at different institutions, of different programme types, and especially for different subject areas may have different perceptions on their learning context. It appears that the CEQ-portion of the instrument is able to largely capture these differences thereby supporting its *discriminant validity*. However, it should also be noted that the effect sizes of these differences were all small. In terms of simple assessments of *criterion validity*, the present study found *Good Teaching* and *Generic Skills* to be significantly related to students' satisfaction and expected performance (as expected). However, it found no significant effect of *Appropriate Workload* or *Appropriate Assessment* on students' satisfaction and expected performance (cf. Section 5.2.5). This finding is contrary to the results of most other published work and deserves further exploration in future investigation.

Nevertheless, despite the fact that the validation of the adapted CEQ for application in the local context has not been completely satisfactory, plausible explanations for the differences from previous findings and possible directions for scale revisions in future investigation have initially been identified in most of the cases (cf. Section 4.1). The present study thus indicates that the CEQ, with further revision of some scales, should be able to serve as a basis for the design of an instrument for the effective collection of students' perceptions of their learning environment in this new response context.

From the present study it is clear that the reliability and validity of the ILS-portion of the composite research instrument are satisfactory. The alpha values of the adapted ILS scales range between 0.50 and 0.78, which are comparable to the results of other published work. Four factors were identified from the exploratory factor analysis of the ILS scores. As cultural differences in pedagogical and educational practices may be reflected in students' learning patterns, it is not surprising that the identified factor structure does not resemble the factor structure reported by Vermunt (1998) in a Dutch context, but resembles the relevant features of the factor structure reported by Ajisuksmo and Vermunt (1999) in an Indonesian context.

The findings in Section 5.1.2 constitute initial evidence for arguing that students pursuing programmes at different institutions, of different programme types, and for different subject areas may have different learning patterns; the ILS-portion of the instrument is able to largely capture these differences and therefore to a certain extent its discriminant validity is confirmed. However, it should be noted again that the effect sizes of these differences are mostly small.

For simple assessments of criterion validity, findings are that when variations in students' background and perceptions are taken into account, students who are personally interested in their studies tend to be more satisfied with the programme, and students who are ambivalent in their studies tend to be less satisfied with the programme (cf. Section 5.2.6). Furthermore students' processing strategies have basically no significant effects on their satisfaction, a finding similar to that reported in Richardson (2006). Also found was a significant relationship between students' adoption of an undirected leaning pattern and their expectation of low academic performance, a finding that is consistent with the findings of most published work, e.g.

Busato *et al.* (1998). In general, the present study has broadly confirmed the validity of the adapted ILS for application in the context of the post-secondary education in Hong Kong.

6.2.2 Initial Findings on Systematic Relationships among the Constructs of Interest

In regard to students' demographic background as denoted by *age*, *gender* and *prior qualification*, findings indicate that the effect of these observables on students' perceptions of the learning context is mostly not significant. These findings are comparable to the results reported in Study 1 of Richardson (2006). Findings also indicate that students' prior qualifications have basically no statistically significant effect on their learning patterns. Similar to Study 1 of Richardson (2006), the present study also found that students' processing strategies are basically unrelated to their age. However, older students tend to experience more self-regulation on learning content and external regulation on learning results. In general, male students tend more to be active learners, and female students tend more to be passive learners, and this tendency is unaffected by students' perceptions (cf. Section 5.2.3).

As expected, it was found that students' demographic background is unrelated to their satisfaction with the programme. It was also found that students' age and gender have no effect on their expected performance, but that students with higher prior qualifications tend to expect to achieve a higher performance. These findings are similar to those reported in Study 1 of Richardson (2006) (cf. Section 5.2.4).

Among the four possible patterns of relationship suggested by Richardson (2006) between students' perceptions of their learning environment and students' study behaviors (or their learning patterns as investigated in the present study), present findings support the argument that the causal link between students' perceptions and their learning patterns is bi-directional in nature (cf. Section 5.2.7). This finding is similar to that reported in Richardson (2006), and it suggests that attempts to enhance the quality of student learning need to address both sets of constructs.

Regarding relationships between the ILS components, the present findings suggest the possible existence of significant direct effects of students' mental models on their learning orientations (cf. Section 5.2.10) which, to the author's knowledge, has not been previously reported.

Other findings concerning the ILS components are largely consistent with previous published work, for example the association of students' adoption of a *Construction of Knowledge* mental model with self-regulation strategies, and students' adoption of an *Intake of Knowledge* mental model with external regulation strategies (cf. Section 5.2.11). In particular, the present study (cf. Sections 5.2.12 to 5.2.14) indicates that students' processing strategies are most directly influenced by their regulation strategies, while the influence of students' mental models and students' learning orientations on their processing strategies is mostly indirect, via students' regulation strategies. These findings support Vermunt's (1998) position on the central role assumed by regulation strategies within the ILS domain, and the applicability of his model in the post-secondary Hong Kong response context. These findings are also consistent with the results reported in Section 5.3.2, which measure the strength of possible relationships between the ILS components from the perspective of explained variance manifested as the coefficients of determination (i.e. the R^2 values) in regression analyses.

In further exploring the strength of the relationships between the factors that may affect student learning, the present study used the magnitude of partial correlation coefficients, standardized regression coefficients or coefficients of determination as measures of effect size. In particular, the relationships between students' learning patterns and their demographic background, or their perceptions of the learning context, or other possibly relevant factors such as students' interest and expected performance in the programme and the difficulty of the programme as perceived by students, were individually analyzed. Among all these factors, students' perceptions were found to have the most significant influence on students' learning patterns (cf. Section 5.3.1). This finding further confirms the close relationships between students' perceptions and their learning patterns, and the need to address both sets of constructs in attempts to enhance the quality of student learning.

Finally, through the real-life examples of the *Construction of Knowledge* mental model being a possible common cause of variations in students' learning orientations and processing strategies (cf. Section 5.2.13), the present study was able to empirically demonstrate the possibility of indirect spurious effects between learning components. Thus identified is an omission in the models proposed by Richardson (2006, 2007).

6.3 Implications for the Quality Endeavor

A basic thrust of the present study, against the complexity of an education system and the contestability of the concept of educational quality, is the belief that a practical approach to address the issues arising from these phenomena is the provision of relevant evidence to inform the quality endeavor. From the perspective of *quality as transformation*, appropriate data on student learning collected via validated and reliable instruments constitute an important source of such evidence.

6.3.1 Implications for Quality Assurance

Post-secondary institutions in Hong Kong, like their counterparts over the world, are increasingly under public pressures to explicitly demonstrate their educational quality. However, affected by the current practice of quality evaluation, resources and efforts (which are already limited) have typically been committed more to the institutional aspects of the quality issues in most institutions. As a result, insufficient attention is paid to the student aspects, in particular the quality of student learning, which should be of paramount concern in the education reform of Hong Kong, especially for the post-secondary education sector in which a substantial expansion of student participation has occurred.

The present study has demonstrated that it is possible for educational institutions to add a new dimension to their internal quality monitoring (IQM) systems by developing and using quantitative instruments to collect relevant data on student learning in a practical manner, through appropriate adaptation of well-tested research instruments, and thereby largely exploiting the knowledge and experiences accumulated in the field of student learning. Although subsequent refinements may still be needed, such adapted instruments can form the basis of a monitoring system to provide profiling data on student learning, or a diagnostic system to identify and address individual student learning problems, so that the QA of these institutions can be conducted in a research-informed, evidence-based and improvement-led manner.

6.3.2 Implications for Quality Monitoring

In Harvey and Newton's (2004) review of quality evaluation, Brown was cited in arguing that the imbalance between regulation and improvement has proved to be a major obstacle to the development of UK higher education (p.159), and Morris was cited in arguing that educational institutions and QA agencies have tended to develop policy and procedures in something of an evidential vacuum (p.161). To a large extent, such remarks also apply to the post-secondary education of Hong Kong. To help shift the focus of the quality endeavor towards the improvement end of the quality spectrum, the practice of EQM must be transformed to focus more directly on the object of education, the learner and the learning experience, with more attention given to internal processes and internal motivators (p.161).

For institutions whose practice of accountability is well established (e.g., those with track records on accreditation), a key focus of the EQM should be the learning environment and students' learning experiences, and any organizational processes which impinge upon them. A new dimension to be added to the EQM, which is currently absent, is an emphasis on a research-informed perspective and capability (p.161), especially on the part of the institutions. The requirement for these institutions to self-evaluate their educational quality through evidence from student surveys collected via the instruments used in the present study (or other similar ones) should be a viable and important step to transform the EQM. Such a step can lead to the IQM practice of these institutions being research-informed and evidence-based, the relevant part of EQM being 'light touch' and enhancement-led, and the relationship between

EQM and IQM being more harmony and thus reducing the negative sentiment of 'feeding the beast' on the part of academic staff (Newton, 2000).

6.4 Concluding Remarks

Before ending the thesis, it is imperative to review the design of the present study and its major methodology, and to suggest possible directions for future research.

6.4.1 Reviewing the Present Design and Methodology

A limitation of the present study is its selected platform of investigation, which comprises six institutions all of which are under Caritas Audit and Higher Education Service (cf. Section 3.3.1). Although the similar nature and orientations of all the post-secondary programmes being offered in Hong Kong is expected to help alleviate the concern about the general applicability of the present findings in the whole sector (cf. Section 3.6.3), a replication of the present study at a different group of institutions or on a different sample of students will certainly help verify these findings and improve their credibility.

Before the administration of the research instrument, the author was able to collect suggestions on the instrument design from a few staff members of the participating institutions. However, most of the feedback was superficial and was about minor design issues. In reflection, a pilot test of the research instrument on a small group of students should have been conducted before its administration in the participating institutions. Such a pilot test, if conducted before the survey, may have enabled the author to identify and address some weaknesses of the research instrument (e.g., the low internal consistency of the *Clear Goals and Standards* scale) at an earlier stage.

It is also acknowledged that in exploring for systematic relationships among the relevant constructs, the present study adopted a conservative approach in its data analysis in contrast to more sophisticated modeling (e.g., hierarchical linear models) and disregarded the fact that the students concerned were in fact exposed to different kinds of learning environment (cf. Section 5.1.3). Furthermore, the major framework of data analysis for the present study is derived from Richardson's (2006, 2007) general theoretical model. Although more powerful than most models previously used in published work, it is still subject to the causal ambiguity inherited from correlational studies (cf. Section 3.6.4), and may still be an insufficient representation of the 'real world' that cannot rule out the possibility of important constructs being excluded from analyses (cf. Section 5.3.3).

Nevertheless, and against the above limitations and drawbacks in design and methodology, it is noteworthy that when compared to most other published work (which have typically employed simple correlational and/or multiple regression analyses on relatively small data samples), the present study is based on a relatively large sample (1,572 cases), has adopted a more rigorous analytical approach which can better delineate the possible direct, indirect and spurious effects among the constructs concerned, and has striven to shed light on the systematic relationships being explored from both the perspectives of statistical significance (in terms of p-values) and practical significance (in terms of effect sizes).

6.4.2 Selected Suggestions for Future Research

As suggested in Section 2.5, an important direction for the development of research into student learning is the extension of the research interest from the individual learner to the learner in social context. Although the present study has already taken an integrative approach to include more constructs under investigation than most other published work, the social nature of learning was in fact only superficially addressed (e.g., through the *Cooperative Learning* scale of the adapted ILS) and therefore constitutes a possible aspect for extending the present research in the future.

Although the ILS-portion of the research instrument was found in the present study to be generally applicable in the local response context of post-secondary education in Hong Kong, the fact that it is unable to sufficiently externalize the experiences of Chinese students in terms of contrasting aspects of memorizing (and understanding) is a concern, especially if the instrument is to be developed into a diagnostic tool for student learning problems in the future. Such a diagnostic tool should be able to distinguish students' exhibition of 'genuine' dissonance (which has been associated with low academic achievement or academic failure) from their exhibition of 'apparent' dissonance (which may be a manifestation of cultural differences). More basic research work to revise the ILS-portion of the instrument so as to endow it with such capability constitutes another aspect for future research.

The present study has leaned heavily on the quantitative paradigm of research methodologies. It is well known that quantitative and qualitative methodologies can in fact complement each other in most investigative endeavors. For the study of complex phenomenon such as student learning, the interplay of both methodologies should enable a researcher to gain a more complete and accurate understanding of the underlying processes. The appropriate incorporation of complementary qualitative analyses therefore constitutes another possible direction for extending the present research.

Finally, it is noteworthy that the length of the research instrument (which comprises 146 items in total) has in fact been raised as a concern in the feedback to the author, both when it was administered in the participating institutions and when the author shared his research work with colleagues. A necessary condition in the present study has been the need to externalize as much student experience as possible for the exploration of systematic relationships among relevant constructs. However, it is anticipated that when converted into a practical tool for regular administration in future, the length of the instrument may be reduced through the appropriate selection and fine-tuning of scales.

With these future directions, the author believes that the present study can be further developed to contribute to the understanding of the complex phenomenon of student learning, and to the promotion of a research-informed, evidence-based, and improvement-led approach to educational quality.

Appendix I - Course Experience Questionnaire (CEQ)

Instructions:

In answering this questionnaire, please think about the course as a whole rather than identifying individual subjects, topics or lecturers. The questions relate to general issues about your course, based on comments that students have often made about their experiences of university teaching and studying. Your responses are strictly confidential and will not be seen by teaching staff.

Scoring:

Items are scored on a scale from 1 to 5, where 1 means 'definitely disagree' and 5 means 'definitely agree'.

Items:

Note:
1. Items 1-36: CEQ36; # items: CEQ30; * items: CEQ23
2. GT: Good Teaching; CQ: Clear Goals and Standards; GS: Generic Skills; AA: Appropriate Assessment; AW: Appropriate Workload; IN: Emphasis on Independence
3. Reversed scale items are highlighted by *italic* font

*	1.	It's always easy here to know the standard of work expected.	CG
*	2.	This course has helped me to develop my problem-solving skills.	GS
#	3.	There are few opportunities to choose the particular areas you want to study.	IN
#*	4.	The teaching staff of this course motivate students to do their best work.	GT
#*	*5.*	*The workload is too heavy.*	AW
*	6.	This course has sharpened my analytic skills.	GS
#	*7.*	*Lecturers here frequently give the impression they have nothing to learn from students.*	AA
#*	8.	You usually have a clear idea of where you're going and what's expected of you.	CG
#*	9.	Staff here put a lot of time into commenting on students' work.	GT
#*	*10.*	*To do well on this course all you really need is a good memory.*	AA
*	11.	This course has helped develop my ability to work as a team member.	GS
*	12.	As a result of doing this course, I feel more confident about tackling unfamiliar problems.	GS
*	13.	This course has improved my written communication skills.	GS
#	*14.*	*It seems to me that the syllabus tries to cover too many topics.*	AW
#	15.	The course has encouraged me to develop my own academic interest as far as possible.	IN
#	16.	Students have a great deal of choice over how they are going to learn in this course.	IN
#*	*17.*	*Staff seem more interested in testing what you've memorized than what you've understood.*	AA

#*	*18.*	*It's often hard to discover what's expected of you in this course.*	CG
#*	19.	We are generally given enough time to understand the things we have to learn.	AW
#*	20.	The staff make a real effort to understand difficulties students may be having with their work.	GT
#	21.	Students here are given a lot of choice in the work they have to do.	IN
#*	22.	Teaching staff here normally give helpful feedback on how you are going.	GT
#*	23.	Our lecturers are extremely good at explaining things to us.	GT
#	*24.*	*The aims and objectives of this course are NOT made very clear.*	CG
#*	25.	Teaching staff here work hard to make subjects interesting.	GT
#*	*26.*	*Too many staff ask us questions just about facts.*	AA
#*	*27.*	*There's a lot of pressure on you as a student here.*	AW
*	28.	This course has helped me develop the ability to plan my own work.	GS
#	*29.*	*Feedback on student work is usually provided ONLY in the form of marks and grades.*	AA
#	30.	We often discuss with our lecturers or tutors how we are going to learn in this course.	IN
#	*31.*	*Staff here show no real interest in what students have to say.*	GT
#	*32.*	*It would be possible to get through this course just by working hard around exam times.*	AA
#	33.	This course really tries to get the best out of all its students.	GT
#	*34.*	*There's very little choice in this course in the ways you are assessed.*	IN
#*	35.	The staff here make it clear right from the start what they expect from students.	CG
#*	*36.*	*The sheer volume of work to be got through in this course means you can't comprehend it all thoroughly.*	AW
	37.	Overall, I am satisfied with the quality of this course.	

Appendix II - Inventory of Learning Styles (ILS)

Note: All items are included in ILS120; * items are excluded from ILS100.

General

Scale scores are computed by adding item scores. There is no reversed scoring.

Domain I: Processing strategies (27 items)

1. Scale Deep processing (11 items)

1a. Subscale Relating and structuring (7 items)

6. I try to combine the subjects that are dealt with separately in a course into one whole.
10. I try to discover the similarities and differences between the theories that are dealt with in a course.
13. I relate specific facts to the main issue in a chapter or article.
*19. I try to relate new subject matter to knowledge I already have about the topic concerned.
25. I try to see the connection between the topics discussed in different chapters of a textbook.
34. I try to construct an overall picture of a course for myself.
35. I compare the conclusions drawn in different chapters.

1b. Subscale Critical processing (4 items)

29. I compare my view of a course topic with the views of the authors of the textbook used in that course.
39. I check whether the conclusions drawn by the authors of a textbook follow the facts on which they are based logically.
43. I draw my own conclusions on the basis of the data that are presented in a course.
49. I try to be critical of the interpretations of experts.

2. Scale Stepwise processing (11 items)

2a. Subscale Memorizing and rehearsing (5 items)

2. I repeat the main parts of the subject matter until I know them by heart.
7. I memorize lists of characteristics of a certain phenomenon.

9. I make a list of the most important facts and learn them by heart.
26. I memorize definitions as literally as possible.
33. I memorize the meaning of every concept that is unfamiliar to me.

2b. Subscale Analysing (6 items)

1. I work through a chapter in a textbook item by item and I study each part separately.
17. I analyse the separate components of a theory step by step.
23. I do not proceed to a subsequent chapter until I have mastered the current chapter in detail.
40. I study details thoroughly.
45. I analyse the successive steps in an argumentation one by one.
*53. I pay particular attention to facts, concepts and problem solving methods in a course.

3. Scale Concrete processing (5 items)

3. I use what I learn from a course in my activities outside my studies.
14. I try to interpret events in everyday reality with the help of the knowledge I have acquired in a course.
22. I pay particular attention to those parts of a course that have practical utility.
48. With the help of the theories presented in a course, I devise solutions to practical problems.
52. When I am studying a topic, I think of cases I know from my own experience that are connected to that topic.

Domain II: Regulation strategies (28 items)

4. Scale Self-regulation (11 items)

4a. Subscale Self-regulation of Learning processes and results (7 items)

21. To test my learning progress when I have studied a textbook, I try to formulate the main points in my own words.
24. When I start reading a new chapter or article, I first think about the best way to study it.
31. When I have difficulty grasping a particular piece of subject matter, I try to analyse why it is difficult for me.
36. To test my learning progress, I try to answer questions about the subject matter which I make up myself.
46. To test whether I have mastered the subject matter, I try to think up other examples and problems besides the ones given in the study materials or by the teacher.

*50. To test my own progress, I try to describe the content of a paragraph in my own words.

51. When I am studying, I also pursue learning goals that have not been set by the teacher but by myself.

4b. Subscale Self-regulation of Learning content (4 items)

16. In addition to the syllabus, I study other literature related to the content of the course.
28. I do more than I am expected to do in a course.
42. I add something to the subject matter from other sources.
54. If I do not understand a study text well, I try to find other literature about the subject concerned.

5. Scale External regulation (11 items)

5a. Subscale External regulation of Learning processes (6 items)

4. If a textbook contains questions or assignments, I work them out completely as soon as I come across them while studying.
5. I study all the subject matter in the same way.
18. I learn everything exactly as I find it in the textbooks.
32. I study according to the instructions given in the study materials or provided by the teacher.

*38. I study the subject matter in the same sequence as it is dealt with in the course.

47. I use the instructions and the course objectives given by the teacher to know

exactly what to do.

5b. Subscale External regulation of Learning results (5 items)

11. I experience the introductions, objectives, instructions, assignments and test items given by the teacher as indispensable guidelines for my studies.
12. I test my learning progress solely by completing the questions, tasks and exercises provided by the teacher or the textbook.
30. If I am able to give a good answer to the questions posed in the textbook or by the teacher, I decide that I have a good command of the subject matter.
44. When doing assignments, I train myself thoroughly in applying the methods dealt with in a course.
55. If I am able to complete all the assignments given in the study materials or by the teacher, I decide that I have a good command of the subject matter.

6. Scale Lack of regulation (6 items)

8. I realize that it is not clear to me what I have to remember and what I do not have to remember.
15. I notice that I have trouble processing a large amount of subject matter.
20. I notice that it is difficult for me to determine whether I have mastered the subject matter sufficiently.
27. I realize that the objectives of the course are too general for me to offer any support.
*37. I notice that the study instructions that are given are not very clear to me.
41. I realize that I miss someone to fall back on in case of difficulties.

Domain III: Learning orientations (25 items)

7. Scale Personally interested (5 items)

57. I do these studies out of sheer interest in the topics that are dealt with.
65. The only aim of my studies is to enrich myself.
69. I see these studies as sheer relaxation.
74. When I have a choice, I opt for courses that suit my personal interests.
78. I do these studies because I like to learn and to study.

8. Scale Certificate directed (5 items)

60. I aim at attaining high levels of study achievements.
63. The main goal I pursue in my studies is to pass exams.
68. What I want in these studies is to earn credits for a diploma.
70. I study above all to pass the exam.
80. To me, written proof of having passed an exam represents something of value in itself.

9. Scale Self-test directed (5 items)

58. I want to prove to myself that I am capable of doing studies in higher education.
61. I want to show others that I am capable of successfully doing a higher education programme.
64. I view the choice I have made to enrol in higher education as a challenge.
72. I want to discover my own qualities, the things I am capable and incapable of.
77. I want to test myself to see whether I am capable of doing studies in higher education.

10. Scale Vocation directed (5 items)

56. When I have a choice, I opt for courses that seem useful to me for my present or future profession.
62. I have chosen this subject area, because it prepares me for the type of work I am highly interested in.
67. For the kind of work I would like to do, I need to have studied in higher education.
71. The main goal I pursue in my studies is to prepare myself for a profession.
73. What I want to acquire above all through my studies is professional skill.

11. Scale Ambivalent (5 items)

59. I doubt whether this is the right subject area for me.
66. I have little confidence in my study capacities.
75. I wonder whether these studies are worth all the effort.
76. I doubt whether this type of education is the right type of education for me.
79. I am afraid these studies are too demanding for me.

Domain IV: Conceptions of learning (40 items)

12. Scale Construction of knowledge (9 items)

85. To me, learning means trying to approach a problem from many different angles, including aspects that were previously unknown to me.
88. I should look for relationships within the subject matter of my own accord.
92. If I have difficulty understanding a particular topic, I should consult other books of my own accord.
*96. In order to learn, I have to summarize in my own words what the subject matter means.
*98. I think I can not just rely on the books recommended by the syllabus, so I have to try to discover myself what else has been written about a particular course topic.
104. To test my own learning progress, I should try to answer questions about the subject matter which I make up myself.
*116. I think good teaching is teaching that includes some preparation on my own part.
117. I should try to think up examples with the study materials of my own accord.
*119. In order to check whether I have mastered the subject matter, I should try to describe the main points in my own words.

13. Scale Intake of knowledge (9 items)

82. I like to be given precise instructions as to how to go about solving a task or doing an assignment.
86. To me, learning is making sure that I can reproduce the facts presented in a course.
94. The teacher should explain clearly what is important and what is less important for me to know.
*100. I should memorize definitions and other facts on my own.
103. Good teaching includes giving a lot of questions and exercises to test whether I have mastered the subject matter.
*106. I should repeat the subject matter on my own until I know it sufficiently.
107. I prefer a type of instruction in which I am told exactly what I need to know for an exam.
*112. To me, learning means: trying to remember the subject matter I am given.
*113. The teacher should give trial tests to enable me to check whether I have mastered all of the subject matter.

14. Scale Use of knowledge (6 items)

81. The things I learn have to be useful for solving practical problems.

90. I should try myself to apply the theories dealt with in a course to practical situations.
95. I have a preference for courses in which a lot of practical applications of the theoretical parts are given.
102. To me, learning means acquiring knowledge that I can use in everyday life.
*108. To me, learning is providing myself with information that I can use immediately or in the longer term.
114. To me, learning means acquiring knowledge and skills that I can later apply in practice.

15. Scale Stimulating education (8 items)

*83. The teacher should motivate and encourage me.
*87. The teacher should inspire me to work out how the course material relates to reality.
91. The teacher should encourage me to combine the separate components of a course into a whole.
97. When I have difficulty understanding something, the teacher should encourage me to find a solution by myself.
*101. When I have difficulties, the teacher should encourage me to find out for myself what causes them.
105. The teacher should encourage me to compare the various theories that are dealt with in a course.
110. The teacher should encourage me to check myself whether I have mastered the subject matter.
118. The teacher should encourage me to reflect on the way I study and how to develop my way of studying.

16. Scale Co-operation (8 items)

84. When I prepare myself for an exam, I prefer to do so together with other students.
89. I like to be encouraged by other students to process the study materials at a particular pace.
93. I prefer to do assignments together with other students.
*99. I think it is important to check with other students to see whether I have sufficiently understood the subject matter.
109. I consider it important to be advised by other students as to how to approach my studies.
*111. When I have difficulty understanding particular topics, I prefer to ask other students for help.

*115. I consider it important to discuss the subject matter with other students.

120. I have a need to work together with other students in my studies.

Appendix III –

The Research Instrument: Post-Secondary Learning Styles and Experiences Questionnaire

INTRODUCTION

This questionnaire was developed to gain clearer insight into how students go about their studies and how they perceive their own learning. It consists of a list of statements on study strategies, motives, attitudes and experiences.

The questionnaire comprises mainly three parts: A, B and C. Each part consists of a list of statements concerning post-secondary education studies and studying. T he statements are adapted from two questionnaires commonly used in Europe and Australia, the *Inventory of Learning Styles* and the *Course Experience Questionnaire*, with slight modification to meet the local context and the purpose of this study. You are requested to indicate to what extent each statement applies to you. You can express your view by circling a number on a scale from 1 to 5.

The purpose of the questionnaire is to identify *individual* views, motives and learning activities. Bear in mind that this list has nothing to do with right or wrong answers. Every person has his own ideas, opinions and study habits. The aim is to gain an insight into your *own* study habits and your personal view of studying and education. This means that an honest answer is automatically a correct answer.

Your responses will be kept strictly confidential and will not be revealed to teachers.

PART A: STUDY ACTIVITIES

Knowledge and insight do not develop on their own: it takes effort to master a particular piece of subject matter. This part of the questionnaire is concerned with the activities students undertake in the context of their studies. Read each statement carefully and then indicate to what extent you yourself engage in the activity concerned while studying. **Terms such as "course" and "subject matter" refer to the courses and subjects you are taking in the last semester. Please think about the courses as a whole rather than identifying subjects, topics or teachers**. The meaning of the numbers after each statement is:

1	2	3	4	5
I do this seldom or never	I do this sometimes	I do this regularly	I do this often	I do this almost always

1.	I work through a chapter in a textbook item by item and I study each part separately.	1	2	3	4	5
2.	I repeat the main parts of the subject matter until I know them by heart.	1	2	3	4	5
3.	I use what I learn from a course in my activities outside my studies.	1	2	3	4	5
4.	If a textbook contains questions or assignments, I work them out completely as soon as I come across them while studying.	1	2	3	4	5
5.	I study all the subject matter in the same way.	1	2	3	4	5
6.	I try to combine the **topics** that are dealt with separately in a course into one whole.	1	2	3	4	5
7.	I memorize lists of characteristics of a certain phenomenon.	1	2	3	4	5
8.	I realize that it is not clear to me what I have to remember and what I do not have to remember.	1	2	3	4	5
9.	I make a list of the most important facts and learn them by heart.	1	2	3	4	5
10.	I try to discover the similarities and differences between the theories that are dealt with in a course.	1	2	3	4	5
11.	I experience the introductions, objectives, instructions, assignments and test items given by the teacher as indispensable guidelines for my studies.	1	2	3	4	5
12.	I test my learning progress solely by completing the questions, tasks and exercises provided by the teacher or the textbook.	1	2	3	4	5

1	2	3	4	5
I do this seldom or never	I do this sometimes	I do this regularly	I do this often	I do this almost always

13.	I relate specific facts to the main issue in a chapter or article.	1	2	3	4	5
14.	I try to interpret events in everyday reality with the help of the knowledge I have acquired in a course.	1	2	3	4	5
15.	I notice that I have trouble processing a large amount of subject matter.	1	2	3	4	5
16.	In addition to the syllabus, I study other literature related to the content of the course.	1	2	3	4	5
17.	I analyse the separate components of a theory step by step.	1	2	3	4	5
18.	I learn everything exactly as I find it in the textbooks.	1	2	3	4	5
19.	I notice that it is difficult for me to determine whether I have mastered the subject matter sufficiently.	1	2	3	4	5
20.	To test my learning progress when I have studied a textbook, I try to formulate the main points in my own words.	1	2	3	4	5
21.	I pay particular attention to those parts of a course that have practical utility.	1	2	3	4	5
22.	I do not proceed to a subsequent chapter **of the textbook** until I have mastered the current chapter in detail.	1	2	3	4	5
23.	When I start reading a new chapter or article, I first think about the best way to study it.	1	2	3	4	5
24.	I try to see the connection between the topics discussed in different chapters of a textbook.	1	2	3	4	5
25.	I memorize definitions as literally as possible.	1	2	3	4	5
26.	I realize that the objectives of the course are too general for me to offer any support.	1	2	3	4	5
27.	I do more than I am expected to do in a course.	1	2	3	4	5
28.	I compare my view of a course topic with the views of the authors of the textbook used in that course.	1	2	3	4	5
29.	If I am able to give a good answer to the questions posed in the textbook or by the teacher, I decide that I have a good command of the subject matter.	1	2	3	4	5

1	2	3	4	5
I do this seldom or never	I do this sometimes	I do this regularly	I do this often	I do this almost always

30. When I have difficulty grasping a particular piece of subject matter, I try to analyse why it is difficult for me.	1	2	3	4	5
31. I study according to the instructions given in the study materials or provided by the teacher.	1	2	3	4	5
32. I memorize the meaning of every concept that is unfamiliar to me.	1	2	3	4	5
33. I try to construct an overall picture of a course for myself.	1	2	3	4	5
34. I compare the conclusions drawn in different chapters.	1	2	3	4	5
35. To test my learning progress, **I make up questions about the subject matter which I then try to answer**.	1	2	3	4	5
36. I check whether the conclusions drawn by the authors of a textbook **logically follow the facts on which they are based**.	1	2	3	4	5
37. I study details thoroughly.	1	2	3	4	5
38. I realize that I miss someone to fall back on in case of difficulties.	1	2	3	4	5
39. I add something to the subject matter from other sources.	1	2	3	4	5
40. I draw my own conclusions on the basis of the data that are presented in a course.	1	2	3	4	5
41. When doing assignments, I train myself thoroughly in applying the methods dealt with in a course.	1	2	3	4	5
42. I analyse the successive steps in an argumentation one by one.	1	2	3	4	5
43. To test whether I have mastered the subject matter, I try to think up other examples and problems besides the ones given in the study materials or by the teacher.	1	2	3	4	5
44. I use the instructions and the course objectives given by the teacher to know exactly what to do.	1	2	3	4	5
45. With the help of the theories presented in a course, I devise solutions to practical problems.	1	2	3	4	5
46. I try to be critical of the interpretations of experts.	1	2	3	4	5
47. When I am studying, I also pursue learning goals that have not been set by the teacher but by myself.	1	2	3	4	5

1	2	3	4	5
I do this seldom or never	I do this sometimes	I do this regularly	I do this often	I do this almost always

48. When I am studying a topic, I think of cases I know from my own experience that are connected to that topic. 1 2 3 4 5

49. If I do not understand a study text well, I try to find other literature about the subject concerned. 1 2 3 4 5

50. If I am able to complete all the assignments given in the study materials or by the teacher, I decide that I have a good command of the subject matter. 1 2 3 4 5

PART B: STUDY MOTIVES AND VIEWS ON STUDYING

B1. Study motives

There can be many reasons for someone to take up a course of study. This part of the questionnaire is concerned with the motives, objectives and attitudes students may have with regard to their studies. Indicate for each statement to what extent it applies to you. Bear in mind that you are *not* asked to indicate whether you think a motive or objective is good, less good or bad; you are only asked to indicate to what extent you think a statement applies to you personally. This is the meaning of the numbers:

1	2	3	4	5
Disagree entirely	Disagree for the most part	Undecided	Agree for the most part	Agree Entirely

51. When I have a choice, I opt for courses that seem useful to me for my present or future profession. 1 2 3 4 5

52. I do these studies out of sheer interest in the topics that are dealt with. 1 2 3 4 5

53. I want to prove to myself that I am capable of doing studies in **post-secondary** education. 1 2 3 4 5

54. I doubt whether this is the right subject area for me. 1 2 3 4 5

55. I aim at attaining high levels of study achievements. 1 2 3 4 5

1	2	3	4	5
Disagree entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

56. I want to show others that I am capable of successfully doing a **post -secondary** education programme.	1 2 3 4 5
57. I have chosen this subject area, because it prepares me for the type of work I am highly interested in.	1 2 3 4 5
58. The main goal I pursue in my studies is to pass exams.	1 2 3 4 5
59. I view the choice I have made to enrol in **post-secondary** education as a challenge.	1 2 3 4 5
60. The only aim of my studies is to enrich myself.	1 2 3 4 5
61. I have little confidence in my study capacities.	1 2 3 4 5
62. For the kind of work I would like to do, I need to have studied in **post-secondary** education.	1 2 3 4 5
63. What I want in these studies is to **be awarded a certificate/ diploma**.	1 2 3 4 5
64. I see these studies as sheer relaxation.	1 2 3 4 5
65. I study above all to pass the exam.	1 2 3 4 5
66. The main goal I pursue in my studies is to prepare myself for a profession.	1 2 3 4 5
67. I want to discover my own qualities, the things I am capable and incapable of.	1 2 3 4 5
68. What I want to acquire above all through my studies is professional skill.	1 2 3 4 5
69. When I have a choice, I opt for courses that suit my personal interests.	1 2 3 4 5
70. I wonder whether these studies are worth all the effort.	1 2 3 4 5
71. I doubt whether this type of education is the right type of education for me.	1 2 3 4 5
72. I want to test myself to see whether I am capable of doing studies in **post-secondary** education.	1 2 3 4 5
73. I do these studies because I like to learn and to study.	1 2 3 4 5
74. I am afraid these studies are too demanding for me.	1 2 3 4 5

1	2	3	4	5
Disagree entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

75. To me, **the record of having passed an exam** represents something of value in itself.	1	2	3	4	5

B2. Study views

What do learning, good education and cooperation with others mean to you? What, according to you, are the tasks of your teachers? What do you regard as your own tasks, as a student? What could be the role of your fellow students in your studies? Questions such as these are addressed in this part of the questionnaire. The statements reflect students' views concerning matters related to learning, being educated, the division of tasks between the student and the educational institution, and the contacts with other students. This part is not so much concerned with the activities you actually undertake in your studies, as with what you consider to be important in general with regard to studying and teaching. Indicate for each statement to what extent it corresponds to your own view. This is the meaning of the numbers:

1	2	3	4	5
Disagree Entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

76. The things I learn have to be useful for solving practical problems.	1	2	3	4	5
77. I like to be given precise instructions as to how to go about solving a task or doing an assignment.	1	2	3	4	5
78. When I prepare myself for an exam, I prefer to do so together with other students.	1	2	3	4	5
79. To me, learning means trying to approach a problem from many different angles, including aspects that were previously unknown to me.	1	2	3	4	5
80. To me, learning is making sure that I can reproduce the facts presented in a course.	1	2	3	4	5
81. I should look for relationships within the subject matter of my own accord.	1	2	3	4	5
82. I like to be encouraged by other students to process the study materials at a particular pace.	1	2	3	4	5

1	2	3	4	5
Disagree Entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

83.	I should try myself to apply the theories dealt with in a course to practical situations.	1	2	3	4	5
84.	The teacher should encourage me to combine the separate components of a course into a whole.	1	2	3	4	5
85.	If I have difficulty understanding a particular topic, I should consult other books of my own accord.	1	2	3	4	5
86.	I prefer to do assignments together with other students.	1	2	3	4	5
87.	The teacher should explain clearly what is important and what is less important for me to know.	1	2	3	4	5
88.	I have a preference for courses in which a lot of practical applications of the theoretical parts are given.	1	2	3	4	5
89.	When I have difficulty understanding something, the teacher should encourage me to find a solution by myself.	1	2	3	4	5
90.	To me, learning means acquiring knowledge that I can use in everyday life.	1	2	3	4	5
91.	Good teaching includes giving a lot of questions and exercises to test whether I have mastered the subject matter.	1	2	3	4	5
92.	To test my own learning progress, I should try to answer questions about the subject matter which I make up myself.	1	2	3	4	5
93.	The teacher should encourage me to compare the various theories that are dealt with in a course.	1	2	3	4	5
94.	I prefer a type of instruction in which I am told exactly what I need to know for an exam.	1	2	3	4	5
95.	I consider it important to be advised by other students as to how to approach my studies.	1	2	3	4	5
96.	The teacher should encourage me to check myself whether I have mastered the subject matter.	1	2	3	4	5
97.	To me, learning means acquiring knowledge and skills that I can later apply in practice.	1	2	3	4	5
98.	I should try to think up examples with the study materials of my own accord.	1	2	3	4	5

1	2	3	4	5
Disagree Entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

99. The teacher should encourage me to reflect on the way I study and how to develop my way of studying. 1 2 3 4 5

100. I have a need to work together with other students in my studies. 1 2 3 4 5

PART C: LEARNING EXPERIENCES

In answering this part of the questionnaire, please think about the courses of the last semester as a whole rather than identifying individual subjects, topics or teachers. The questions relate to general issues about your courses, based on comments that students have often made about their experiences of teaching and studying. Indicate for each statement to what extent it corresponds to your own view. This is the meaning of the numbers:

1	2	3	4	5
Disagree Entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

101. It's always easy here to know the standard of work expected. 1 2 3 4 5

102. **The courses have** helped me to develop my problem-solving skills. 1 2 3 4 5

103. There are few opportunities to choose the particular areas you want to study. 1 2 3 4 5

104. The **teachers** of **the courses** motivate students to do their best work. 1 2 3 4 5

105. The workload is too heavy. 1 2 3 4 5

106. **The courses have** sharpened my analytic skills. 1 2 3 4 5

107. **Teachers** here frequently give the impression they have nothing to learn from students. 1 2 3 4 5

108. You usually have a clear idea of where you're going and what's expected of you. 1 2 3 4 5

1	2	3	4	5
Disagree Entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

109. **Teachers** here put a lot of time into commenting on students' work.	1	2	3	4	5
110. To do well on **the courses** all you really need is a good memory.	1	2	3	4	5
111. **The courses have** helped develop my ability to work as a team member.	1	2	3	4	5
112. As a result of doing **the courses**, I feel more confident about tackling unfamiliar problems.	1	2	3	4	5
113. **The courses have** improved my written communication skills.	1	2	3	4	5
114. It seems to me that the **syllabuses of the courses try** to cover too many topics.	1	2	3	4	5
115. **The courses have** encouraged me to develop my own academic interest as far as possible.	1	2	3	4	5
116. Students have a great deal of choice over how they are going to learn in **the courses**.	1	2	3	4	5
117. **Teachers** seem more interested in testing what you've memorized than what you've understood.	1	2	3	4	5
118. It's often hard to discover what's expected of you in **the courses**.	1	2	3	4	5
119. We are generally given enough time to understand the things we have to learn.	1	2	3	4	5
120. The **teachers** make a real effort to understand difficulties students may be having with their work.	1	2	3	4	5
121. Students here are given a lot of choice in the work they have to do.	1	2	3	4	5
122. **Teachers** here normally give helpful feedback on how you are going.	1	2	3	4	5
123. Our **teachers** are extremely good at explaining things to us.	1	2	3	4	5
124. The aims and objectives of **the courses** are NOT made very clear.	1	2	3	4	5
125. **Teachers** here work hard to make subjects interesting.	1	2	3	4	5
126. Too many **teachers** ask us questions just about facts.	1	2	3	4	5

1	2	3	4	5
Disagree Entirely	Disagree for the most part	Undecided	Agree for the most part	Agree entirely

127. There's a lot of pressure on you as a student here.	1	2	3	4	5
128. **The courses have** helped me develop the ability to plan my own work.	1	2	3	4	5
129. Feedback on student work is usually provided ONLY in the form of marks and grades.	1	2	3	4	5
130. We often discuss with our **teachers** how we are going to learn in **the courses**.	1	2	3	4	5
131. **Teachers** here show no real interest in what students have to say.	1	2	3	4	5
132. It would be possible to get through **the courses** just by working hard around exam times.	1	2	3	4	5
133. **The courses** really **try** to get the best out of all its students.	1	2	3	4	5
134. There's very little choice in **the courses** in the ways you are assessed.	1	2	3	4	5
135. The **teachers** here make it clear right from the start what they expect from students.	1	2	3	4	5
136. The sheer volume of work to be got through in **the courses** means you can't comprehend them all thoroughly.	1	2	3	4	5
137. Overall, I am satisfied with the quality of **the courses**.	1	2	3	4	5

PART D: BACKGROUND INFORMATION

Note: The score of a selected item is highlighted in bold type and shown within square brackets

This part of the questionnaire collects basic background information from you. Please indicate your response by ticking " √ " the appropriate box under each question.

138. Age

☐ 18 or below **[1]** ☐ 19 **[2]** ☐ 20 **[3]** ☐ 21 **[4]**
☐ 22 **[5]** ☐ 23 **[6]** ☐ 24 **[7]** ☐ 25 or above **[8]**

139. Sex

☐ Male [1] ☐ Female [2]

140. The kind of programme you are studying

☐ Project Yi Jin [1] ☐ One-year Certificate [2] ☐ One-year/Two-year Diploma [3]
☐ Foundation Diploma [4] ☐ Associate Degree [5] ☐ Higher Diploma [6]
☐ Top-up Bachelor's Degree [7]

141. Current year of study (Not applicable for one-year programme)

Two-year Diploma : ☐ Year 1 [1] ☐ Year 2 [2]
Associate Degree : ☐ Foundation Year [3] ☐ Year 1 [4] ☐ Year 2 [5]
Higher Diploma : ☐ Year 1 [6] ☐ Year 2 [7] ☐ Year 3 [8] ☐ Year 4 [9]

142. Major subject area of your programme (Please select one category and one sub-item which come closest to describing your major field of study)

☐ Business Administration / Business Studies
- ☐ Accounting [1]
- ☐ Corporate Management [2]
- ☐ Finance [3]
- ☐ General Application [4]
- ☐ Other: ________ [5]

☐ Hospitality / Tourism
- ☐ Hotel [6]
- ☐ Food and Beverage [7]
- ☐ Culinary Arts [8]
- ☐ Tourism [9]
- ☐ Other: ________ [10]

☐ Language Studies
- ☐ Translation / Interpretation [11]
- ☐ Business Communication [12]
- ☐ Other: ________ [13]

☐ Information Technology
- ☐ Computer Studies [14]
- ☐ Business Application [15]
- ☐ Other: ________ [16]

☐ Social Sciences
- ☐ Social Work [17]
- ☐ Other: ________ [18]

☐ Other Category: ________ [19]

143. Number of subjects passed in your previous attempt(s) at the Hong Kong Certificate of Education Examination (HKCEE) [Passes in different years of the same subject should be counted as one]

☐ 1 or below [1] ☐ 2 [2] ☐ 3 [3] ☐ 4 [4] ☐ 5 or above [5]
☐ Never sit for the examination [6]

144. Overall, I think the programme I am current studying is

☐ Very Easy [1] ☐ Easy [2] ☐ Neither Easy Nor Difficult [3] ☐ Difficult [4]
☐ Very Difficult [5]

145. My level of interest in the programme is

☐ Very High [1] ☐ High [2] ☐ Medium [3] ☐ Low [4] ☐ Very Low [5]

146. For this academic year, my expected performance in the programme will be

☐ Very Good [1] ☐ Good [2] ☐ Acceptable [3] ☐ Poor [4] ☐ Very Poor [5]

Consent for Access to Student Record / Interview

For some programmes, data collection will be conducted twice in this study to investigate students' changes during the period. We therefore hope that you can indicate your student ID number and class number to us so that data collected in the two times can be linked appropriately. Moreover, your permission for us to access your student record at the Registry (e.g. to obtain your academic results for analysis) is very important to our study. If deemed necessary, the researcher also hopes to interview some students to discuss and clarify the responses (estimated interview time is about one hour). All collected data and interview records will be kept confidential and used only in this study; no personal information will be revealed. Please complete this part, we would appreciate it if you could permit access to your student record, and agree to participate in the interview. Thank you!

I permit access to my student record for this study: ☐ Yes [1] ☐ No [2]

If necessary, I agree to be interviewed by the researcher: ☐ Yes [1] ☐ No [2]

Student ID No. : ________ Class No.:

Name: ________________________ Signature: ____________________

***** Please check whether you have completed all the questions *****
***** Thank you very much for your participation in this study *****

Appendix IV – Chinese Version of the Research Instrument:專上學生學習模式及經驗問卷

簡介

設計這份問卷的目的是為了了解各位同學的學習狀況以及如何理解自己的學習。問卷由一系列陳述句組成，包括學習的策略、動機、態度和經驗。

問卷主要由甲、乙、丙三部分組成。每部分包括了一系列關於專上教育課堂和學習的陳述句。這些陳述句根據兩個於歐洲及澳洲常用的問卷（Inventory of Learning Styles 和 Course Experience Questionnaire）就本地的情況和這次研究的目的稍作修改而得。請指出每項陳述句對你的適用程度。你可在數值表上圈出 1 至 5 來表示你的選擇。

這份問卷是希望識別學生個人的看法、動機和學習活動。請緊記問卷的陳述句並沒有所謂對與錯的答案。每個人都有自己的想法、意見和學習習慣。我們的目的是為著了解你個人的學習習慣，和對學習和教育的看法和經驗。換句話說，誠實的回答就是正確的答案。

你的回答將會絕對保密，並不會向導師披露。

甲部分：學習活動

知識和洞察力並不是與生俱來的，我們需作努力才能掌握個別學科的知識。問卷這部分是關於學生進行學習所作的活動。請細閱每項陳述句，然後選擇該項活動在你學習時的相關程度。<u>所用的術語如「科目」和「學科內容」是指那些你在上一個學期所修讀的。請將修讀的科目作整體考慮，而非識別某個學科，課題或導師</u>。每項陳述句中的數字意思如下：

1	2	3	4	5
我甚少或從不會做	我有時會做	我有規律地做	我經常地做	我幾乎總是在做

1. 我逐項細讀課本的篇章，並分開學習每一部分。 1 2 3 4 5
2. 我重複學科內容的主要部分，直至我緊記於心為止。 1 2 3 4 5
3. 我在學習以外的活動中運用我在科目中學會的知識。 1 2 3 4 5
4. 如果課本中有題目或習作，當我於學習中讀到時我會立即把它們全部做妥。 1 2 3 4 5
5. 我用同一方法學習所有的學科內容。 1 2 3 4 5
6. 我嘗試把修讀科目分開處理的課題綜合為一。 1 2 3 4 5
7. 我以表列的特點來記著某個現象。 1 2 3 4 5
8. 我明白自己不太了解我必須和不須記著甚麼。 1 2 3 4 5
9. 我列出那些最重要的事實並緊記於心。 1 2 3 4 5
10. 我嘗試去發掘於科目中學到不同理論的相同和不同之處。 1 2 3 4 5
11. 我將導師所提供的介紹、目標、指示、習作和測驗作為我在學習中不可或缺的指引。 1 2 3 4 5
12. 我只靠完成導師或課本提供的問題、作業和練習來測試我的學習進展。 1 2 3 4 5
13. 我把個別的事實連繫到課文或文章的主要論點。 1 2 3 4 5
14. 我嘗試運用我在科目中所學到的知識來幫助理解每日所發生的事情。 1 2 3 4 5
15. 我留意到自己對處理大量的學科內容存有困難。 1 2 3 4 5
16. 在教學大綱範圍之外，我閱讀其他與科目內容有關的著作。 1 2 3 4 5
17. 我逐步地分析所學理論的不同部分。 1 2 3 4 5

1 我甚少 或從不會做	2 我有時會做	3 我有規律地做	4 我經常地做	5 我幾乎總是 在做

18. 我完全跟著課本所描述的去學習每一事物。 1 2 3 4 5
19. 我留意到自己對是否已充分掌握學科內容存有困難。 1 2 3 4 5
20. 為了測試自己的學習進展，我於溫習課本後嘗試用自己的語言來表達那些重點。 1 2 3 4 5
21. 我對修讀科目中那些有實際應用的部分特別留意。 1 2 3 4 5
22. 直至我能夠詳細地掌握課本現在的篇章後，我才會開始下一篇章。 1 2 3 4 5
23. 當我開始閱讀新的課文或文章時，我先考慮學習它的最佳方法。 1 2 3 4 5
24. 我嘗試找出課本中不同篇章所討論的課題間的連繫性。 1 2 3 4 5
25. 我盡可能逐字去記憶那些定義。 1 2 3 4 5
26. 我明白科目的目標對我來說過於廣泛，難以給我任何支援。 1 2 3 4 5
27. 我比科目要求的做得更多。 1 2 3 4 5
28. 我把自己對學科課題的觀點，與該科目所使用的課本作者的觀點作比較。 1 2 3 4 5
29. 如果我可以就課本或導師的問題給予好的答案，我便認為自己對學科內容有好的掌握。 1 2 3 4 5
30. 當我對掌握某些學科內容存有困難時，我嘗試去分析導致我覺得困難的原因。 1 2 3 4 5
31. 我根據教材或導師所提供的指示來學習。 1 2 3 4 5
32. 我記住每一個自己不熟悉的概念的意義。 1 2 3 4 5
33. 我嘗試對科目建構一個整體圖像給自己。 1 2 3 4 5
34. 我比較不同篇章內提出的結論。 1 2 3 4 5
35. 為了測試自己的學習進展，我嘗試去回答自己對該學科內容所提出的問題。 1 2 3 4 5
36. 我核對課文中作者提出的結論是否根據邏輯，符合事實。 1 2 3 4 5
37. 我徹底地學習細節。 1 2 3 4 5
38. 我知道當面對困難時，我欠缺一個可以倚靠的人。 1 2 3 4 5
39. 我由其他來源找尋資料加入學科內容中。 1 2 3 4 5

1 我甚少 或從不會做	2 我有時會做	3 我有規律地做	4 我經常地做	5 我幾乎總是 在做

40. 根據修讀科目所教授的資料，我提出自己的結論。	1 2 3 4 5
41. 在做習作時，我徹底地訓練自己去運用科目中所教授的方法。	1 2 3 4 5
42. 我逐項分析論點中連續的步驟。	1 2 3 4 5
43. 為了測試自己是否已掌握學科內容，我嘗試在導師或教材所作提供以外去想出其他例子和問題。	1 2 3 4 5
44. 我運用導師所給予的指引和學科目標來確知該做甚麼。	1 2 3 4 5
45. 藉著修讀科目所提供的理論，我設計解決實際問題的方法。	1 2 3 4 5
46. 我嘗試對專家的闡釋保持批判的態度。	1 2 3 4 5
47. 當我學習時，我也會追求一些由自己而非導師釐訂的學習目的。	1 2 3 4 5
48. 當我學習一個課題時，我想起那些與該課題相關而由個人經驗得知的事例。	1 2 3 4 5
49. 如果我不太明白課文，我會嘗試參閱其他與該學科相關的著作。	1 2 3 4 5
50. 如果我能夠完成所有由教材或導師所給予的習作，我便認為自己對學科內容具有好的掌握。	1 2 3 4 5

乙部分：學習動機和對學習的看法

乙一、學習動機

很多原因可以令一個人修讀某個科目。在這部分，我們將看看動機、目的和態度與學習的關係。請指出每項陳述句對你的適用程度。謹記你並不是要去表示你認為哪個動機或目的是好、不太好或壞；你只須表示你認為該陳述句對你個人的合適程度。以下是各數字的代表意思：

1	2	3	4	5
完全不同意	大部分不同意	未能決定	大部分同意	完全同意

51.	當我有選擇時，我會選取一些對我現在或將來的職業有用的科目。	1 2 3 4 5
52.	我對學習中的課題選擇完全是基於興趣。	1 2 3 4 5
53.	我想向自己證明我有能力接受專上教育。	1 2 3 4 5
54.	我懷疑這學科對我來說是否合適。	1 2 3 4 5
55.	我以獲取良好的學業成績為目標。	1 2 3 4 5
56.	我想給別人看到我有能力成功地修讀一個專上教育課程。	1 2 3 4 5
57.	我選擇這學科是因為它替我在非常感興趣的工作上作準備。	1 2 3 4 5
58.	我在學習上追求的主要目標是考試合格。	1 2 3 4 5
59.	我把自己選入讀專上教育視作一項挑戰。	1 2 3 4 5
60.	我學習的唯一目的是充實自己。	1 2 3 4 5
61.	我對自己的學習能力信心不大。	1 2 3 4 5
62.	為了做到自己想做的工作，我需要接受專上教育。	1 2 3 4 5
63.	我希望於這些學習中得到的是獲取證書/文憑。	1 2 3 4 5
64.	我把這些學習完全視作娛樂。	1 2 3 4 5
65.	我學習中最重要的是考試合格。	1 2 3 4 5
66.	我追求學業的主要目的是為自己將來的職業作準備。	1 2 3 4 5
67.	我想發掘自己的品質，找出我能夠和不能夠做到的事。	1 2 3 4 5
68.	我最想在學業中獲得的是專業技巧。	1 2 3 4 5
69.	當我有選擇，我選取那些符合我個人興趣的科目。	1 2 3 4 5
70.	我問自己花在學習的努力是否值得。	1 2 3 4 5
71.	我懷疑現在這種形式的教育是否適合我。	1 2 3 4 5
72.	我想測試一下自己是否有能力接受專上教育。	1 2 3 4 5
73.	我接受這些教育是因為我喜歡學習和讀書。	1 2 3 4 5
74.	我恐怕這些學習對我來說是要求過高。	1 2 3 4 5
75.	對我而言，考試合格的紀錄本身代表某種價值。	1 2 3 4 5

乙二、學習看法

學習、好的教育、與別人合作對你來說代表著甚麼？對你而言，導師的工作是甚麼？作為一位學生，你覺得自己的工作是甚麼？同學對你來說的角色是甚麼？類似的問題將會在這部分中探討。以下陳述句反映了學生對學習、接受教育、學生與學校之間的分工及與其他同學接觸的看法。這部分並不太關注你在學習中實際進行的活動，但關注你認為學習和教導中那些元素普遍重要。請指示出每項陳述句對你個人看法的合適程度。以下是各數字的代表意思：

1	2	3	4	5
完全不同意	大部分不同意	未能決定	大部分同意	完全同意

76. 我所學習的東西必須對解決實際問題有用。 1 2 3 4 5
77. 我喜歡被給予清晰的指示以知道怎樣去解決問題或做習作。 1 2 3 4 5
78. 當我要預備考試時，我喜歡和其他同學一起溫習。 1 2 3 4 5
79. 對我而言，學習是指從不同角度去處理問題，包括我從前不知曉的方面。 1 2 3 4 5
80. 對我而言，學習就是確令自己能默寫出科目所教授的事實。 1 2 3 4 5
81. 我應該自己去找出學科內容中的各種關係。 1 2 3 4 5
82. 我喜歡被其他同學鼓勵去以特定的步伐來學習教材。 1 2 3 4 5
83. 我應該自己嘗試去把那些在科目中學到的理論運用於現實情況裏。 1 2 3 4 5
84. 導師應該鼓勵我去將那些於科目中學到的不同部分綜合為一個整體。 1 2 3 4 5
85. 如果我對於明白某一課題存有困難時，我應該自己去查閱其他書籍。 1 2 3 4 5
86. 我比較喜歡與其他同學一起做習作。 1 2 3 4 5
87. 導師應該向我解釋清楚哪些內容重要，哪些不那麼重要。 1 2 3 4 5
88. 我比較喜歡那些對理論部分提供很多實際應用的科目。 1 2 3 4 5
89. 當我對明白某些東西存有困難時，導師應該鼓勵我自己去找尋答案。 1 2 3 4 5
90. 對我而言，學習是指獲取一些我可應用於每日生活中的知識。 1 2 3 4 5

1	2	3	4	5
完全不同意	大部分不同意	未能決定	大部分同意	完全同意

91. 好的教導包括給予很多題目和習作來測試我是否已掌握學科內容。 1 2 3 4 5

92. 為了測試自己的學習進展，我應該嘗試去回答那些我自己設計關於學科內容的問題。 1 2 3 4 5

93. 導師應該鼓勵我去比較那些在科目中所學到的不同理論。 1 2 3 4 5

94. 我比較喜歡被給予明確的指示來告知我要懂得甚麼來預備考試。 1 2 3 4 5

95. 我認為由其他同學提議我應怎樣去學習是很重要的。 1 2 3 4 5

96. 導師應該鼓勵我檢查自己是否已掌握了學科內容。 1 2 3 4 5

97. 對我而言，學習是指獲取那些可應用於將來的知識和技巧。 1 2 3 4 5

98. 我應該嘗試自己去運用教材來想出不同的例子。 1 2 3 4 5

99. 導師應該鼓勵我去反思我學習的方式，以及如何去發展我自己的學習方式。 1 2 3 4 5

100. 我需要與其他同學一起學習。 1 2 3 4 5

丙部分、學習經驗

<u>回答這部分時，請細想上一個學期整個課程的所有科目，而非識別某個學科，課題或導師</u>。以下陳述句根據學生常常就上課和學習經驗的意見而設計，提問關於你修讀科目的一般情況。請指示出每項陳述句對你個人看法的合適程度。以下是各數字的代表意思：

1	2	3	4	5
完全不同意	大部分不同意	未能決定	大部分同意	完全同意

101. 學生總是容易知道這裏對習作水準的期望。 1 2 3 4 5

102. 修讀的科目幫助我發展解決問題的技巧。 1 2 3 4 5

103. 學生有很少機會選擇想修讀的特別範圍。 1 2 3 4 5

104. 科目的導師推動同學去做到最好。 1 2 3 4 5

105. 修讀科目的工作量太重。 1 2 3 4 5

1 完全不同意	2 大部分不同意	3 未能決定	4 大部分同意	5 完全同意

106. 修讀的科目使我的分析技巧變得敏銳。	1 2 3 4 5
107. 這裏的導師常常給人不從學生身上學習的印象。	1 2 3 4 5
108. 學生通常對自己的路向和學校對自己的期望有清晰的念頭。	1 2 3 4 5
109. 這裏的導師花很多時間去評改學生的習作。	1 2 3 4 5
110. 要在修讀的科目中獲得好成績，你真正需要的是良好的記憶力。	1 2 3 4 5
111. 修讀的科目幫助我發展於群組內工作的能力。	1 2 3 4 5
112. 由於修讀這些科目，我對於處理不熟悉的問題更有信心。	1 2 3 4 5
113. 修讀的科目改善了我的寫作溝通技巧。	1 2 3 4 5
114. 我覺得修讀科目的教學大綱企圖涵蓋太多課題。	1 2 3 4 5
115. 修讀的科目鼓勵我盡量去發展自己的學術興趣。	1 2 3 4 5
116. 對於怎樣去學習所修讀的科目，學生有很多選擇。	1 2 3 4 5
117. 導師似乎較喜歡測試我所記憶的，多於我所明白的。	1 2 3 4 5
118. 在修讀的科目裏，你常常很難發現對你的要求是甚麼。	1 2 3 4 5
119. 我們大致上有足夠的時間去理解要學習的東西。	1 2 3 4 5
120. 導師真正盡力去明白學生在習作上可能遇到的困難。	1 2 3 4 5
121. 這裏的學生在他們要做的習作上有很多選擇。	1 2 3 4 5
122. 這裏的導師一般會就你的進度提供有幫助的意見。	1 2 3 4 5
123. 我們的導師非常擅於向我們解釋事物。	1 2 3 4 5
124. 修讀科目的目標和宗旨訂得不夠清楚。	1 2 3 4 5
125. 這裏的導師努力令學科變得有趣。	1 2 3 4 5
126. 太多的導師問我們只關於事實的問題。	1 2 3 4 5
127. 在這裏當學生，有很大的壓力。	1 2 3 4 5
128. 修讀的科目幫助我發展能力去計劃自己的工作。	1 2 3 4 5
129. 對學生的習作，導師往往只是以分數和等級的形式作回應。	1 2 3 4 5
130. 我們常與導師討論怎樣去學習所修讀的科目。	1 2 3 4 5

1	2	3	4	5
完全不同意	大部分不同意	未能決定	大部分同意	完全同意

131. 這裏的導師對學生的意見表現得毫無興趣。 1 2 3 4 5

132. 只需在考試期間努力就有可能完成所修讀的科目。 1 2 3 4 5

133. 修讀的科目真正嘗試帶出所有學生的優點。 1 2 3 4 5

134. 修讀的科目評核學生的方法選擇非常少。 1 2 3 4 5

135. 這裏的導師一開始已明確表示他們對學生的期望。 1 2 3 4 5

136. 修讀科目中十足的工作量，令你不能徹底理解所有內容。 1 2 3 4 5

137. 總括而言，我滿意所修讀科目的質素。 1 2 3 4 5

丁部分、個人資料

問卷這部分收集同學簡單的個人資料，請於適當的空格內打上"√"號。

138. 年齡

☐ 18 或以下 ☐ 19 ☐ 20 ☐ 21
☐ 22 ☐ 23 ☐ 24 ☐ 25 或以上

139. 性別

☐ 男 ☐ 女

140. 修讀課程種類

☐ 毅進課程 ☐ 一年制證書 ☐ 一/二年制文憑
☐ 基礎文憑 ☐ 副學士 ☐ 高級文憑 ☐ 學士學位銜接課程

141. 現時修讀年期（一年制課程同學不須回答這問題）

二年制文憑 ： ☐ 一年級 ☐ 二年級
副學士 ： ☐ 基礎課程 ☐ 一年級 ☐ 二年級
高級文憑 ： ☐ 一年級 ☐ 二年級 ☐ 三年級 ☐ 四年級

142. 修讀課程主要類別（請只選擇最接近的一個主要類別及一個項目）

- ☐ 工商管理/商科
  - ☐ 會計
  - ☐ 企業管理
  - ☐ 財務
  - ☐ 一般應用
  - ☐ 其他：

- ☐ 款待/旅遊
  - ☐ 酒店
  - ☐ 餐飲
  - ☐ 廚藝
  - ☐ 旅遊
  - ☐ 其他：

- ☐ 語文
  - ☐ 翻譯/傳譯
  - ☐ 商業傳意
  - ☐ 其他：

- ☐ 資訊科技
  - ☐ 電腦學
  - ☐ 商業應用
  - ☐ 其他：

- ☐ 社會科學
  - ☐ 社會工作
  - ☐ 其他：

- ☐ 其他類別：

143. 以前於中學會考中合格科目的數目（不同年分相同科目只作一科）

☐ 1 或以下 ☐ 2 ☐ 3 ☐ 4 ☐ 5 或以上
☐ 從未參加考試

144. 整體而言，我覺得現在修讀的課程的科目

☐ 很易　☐ 易　☐ 不易不難　☐ 難　☐ 很難

145. 我對整個課程的興趣

☐ 很高　☐ 高　☐ 一般　☐ 低　☐ 很低

146. 我預期自己在課程中，這個學年的表現

☐ 很好　☐ 好　☐ 可接受　☐ 差　☐ 很差

資料收集／面談同意書

這個研究計劃將於一年中對部分課程進行兩次資料收集，以便了解同學其間的轉變。因此我們希望你能提供你的學生編號及班別，使兩次收集的資料能適當地聯系。此外，能取得你於註冊處的資料（例如成績）以作分析，對這次研究非常重要。如需要，研究員也希望能與部分同學作面談（估計約 1 小時）以便能更加深入了解情況。所有資料及面談紀錄只作研究用途，並將會絕對保密，任何個人情況不會對外披露。請填寫以下部分，我們希望能得到你同意提供資料，參與面談。謝謝!

我同意我於註冊處的資料可用於這次研究：☐ 是 ☐ 否

如需要，我願意與研究員面談：☐ 是 ☐ 否

學生編號：__________　班別：

姓名　：__________　簽名：

*** 請檢查是否所有題目已填妥，非常感謝你參加這個研究計劃 ***

Appendix V - Distribution of Responses in the Collected Data

The distribution of responses for each instrument item (in terms of percentage) is summarized in the following tables.

PART A: STUDY ACTIVITIES

S/N: I do this seldom or never; S: I do this sometimes; R: I do this regularly; O: I do this often; AA: I do this almost always; X: missing value

Instrument Item	S/N	S	R	O	AA	X
1. I work through a chapter in a textbook item by item and I study each part separately.	13.1	54.7	25.2	5.7	1.2	0.1
2. I repeat the main parts of the subject matter until I know them by heart.	9.9	45.4	31.5	10.9	2.1	0.1
3. I use what I learn from a course in my activities outside my studies.	8.8	39.3	30.8	17.8	3.2	0.1
4. If a textbook contains questions or assignments, I work them out completely as soon as I come across them while studying.	11.0	43.0	32.0	10.4	3.4	0.2
5. I study all the subject matter in the same way.	11.4	34.4	31.8	17.2	5.1	0.1
6. I try to combine the topics that are dealt with separately in a course into one whole.	21.9	41.4	28.3	6.3	1.8	0.3
7. I memorize lists of characteristics of a certain phenomenon.	15.6	32.4	29.9	17.2	4.6	0.3
8. I realize that it is not clear to me what I have to remember and what I do not have to remember.	11.3	33.4	35.5	14.7	4.9	0.3
9. I make a list of the most important facts and learn them by heart.	4.6	23.6	37.3	26.5	7.7	0.2
10. I try to discover the similarities and differences between the theories that are dealt with in a course.	14.8	38.1	31.1	13.4	2.3	0.3
11. I experience the introductions, objectives, instructions, assignments and test items given by the teacher as indispensable guidelines for my studies.	6.9	29.4	35.6	21.6	6.4	0.1
12. I test my learning progress solely by completing the questions, tasks and exercises provided by the teacher or the textbook.	6.6	29.6	37.1	20.7	5.8	0.1
13. I relate specific facts to the main issue in a chapter or article.	11.8	36.5	37.0	12.3	2.2	0.1
14. I try to interpret events in everyday reality with the help of the knowledge I have acquired in a course.	11.1	32.8	34.3	17.5	3.8	0.5
15. I notice that I have trouble processing a large amount of subject matter.	6.2	27.8	34.6	21.7	9.5	0.2
16. In addition to the syllabus, I study other literature related to the content of the course.	19.1	38.5	29.3	10.3	2.7	0.1
17. I analyse the separate components of a theory step by step.	13.2	39.9	34.4	10.9	1.6	0.1
18. I learn everything exactly as I find it in the textbooks.	10.0	42.7	34.6	10.5	2.1	0.1

Instrument Item	S/N	S	R	O	AA	X
19. I notice that it is difficult for me to determine whether I have mastered the subject matter sufficiently.	6.7	34.3	35.9	18.8	4.3	0.2
20. To test my learning progress when I have studied a textbook, I try to formulate the main points in my own words.	12.2	31.7	34.8	16.2	4.7	0.3
21. I pay particular attention to those parts of a course that have practical utility.	4.6	20.7	36.0	28.2	10.5	0.1
22. I do not proceed to a subsequent chapter of the textbook until I have mastered the current chapter in detail.	14.0	38.7	31.3	12.9	2.8	0.3
23. When I start reading a new chapter or article, I first think about the best way to study it.	19.1	35.8	30.3	11.7	3.0	0.1
24. I try to see the connection between the topics discussed in different chapters of a textbook.	15.1	37.4	33.9	11.3	2.2	0.2
25. I memorize definitions as literally as possible.	16.0	33.4	28.0	17.6	5.0	0.1
26. I realize that the objectives of the course are too general for me to offer any support.	9.8	36.2	36.4	13.0	3.9	0.8
27. I do more than I am expected to do in a course.	23.6	39.9	26.3	7.9	2.2	0.1
28. I compare my view of a course topic with the views of the authors of the textbook used in that course.	23.3	35.7	31.0	8.3	1.6	0.1
29. If I am able to give a good answer to the questions posed in the textbook or by the teacher, I decide that I have a good command of the subject matter.	7.4	33.2	35.2	19.5	4.6	0.1
30. When I have difficulty grasping a particular piece of subject matter, I try to analyse why it is difficult for me.	7.1	33.2	36.8	19.1	3.6	0.2
31. I study according to the instructions given in the study materials or provided by the teacher.	5.4	25.3	37.7	24.7	6.7	0.1
32. I memorize the meaning of every concept that is unfamiliar to me.	8.2	31.8	38.3	17.9	3.5	0.3
33. I try to construct an overall picture of a course for myself.	18.2	35.7	30.0	13.2	2.7	0.3
34. I compare the conclusions drawn in different chapters.	19.7	39.0	28.5	10.7	2.0	0.2
35. To test my learning progress, I make up questions about the subject matter which I then try to answer.	12.1	37.4	34.5	13.4	2.2	0.3
36. I check whether the conclusions drawn by the authors of a textbook logically follow the facts on which they are based.	16.8	35.2	32.9	11.6	3.3	0.1
37. I study details thoroughly.	12.7	38.8	34.3	11.2	2.8	0.3
38. I realize that I miss someone to fall back on in case of difficulties.	13.7	29.9	30.8	16.8	8.8	0.1
39. I add something to the subject matter from other sources.	13.6	33.3	35.0	14.0	4.0	0.1
40. I draw my own conclusions on the basis of the data that are presented in a course.	16.4	40.9	32.5	7.8	2.3	0.1
41. When doing assignments, I train myself thoroughly in applying the methods dealt with in a course.	8.7	33.9	38.3	16.1	2.9	0.1

Instrument Item	S/N	S	R	O	AA	X
42. I analyse the successive steps in an argumentation one by one.	10.6	35.9	36.0	14.5	3.0	0.1
43. To test whether I have mastered the subject matter, I try to think up other examples and problems besides the ones given in the study materials or by the teacher.	14.6	38.3	32.6	12.3	2.0	0.3
44. I use the instructions and the course objectives given by the teacher to know exactly what to do.	8.6	29.3	41.4	17.6	3.0	0.1
45. With the help of the theories presented in a course, I devise solutions to practical problems.	14.0	36.1	36.2	10.8	2.6	0.2
46. I try to be critical of the interpretations of experts.	23.2	34.0	28.3	11.7	2.7	0.1
47. When I am studying, I also pursue learning goals that have not been set by the teacher but by myself.	15.6	35.1	31.5	13.7	3.6	0.4
48. When I am studying a topic, I think of cases I know from my own experience that are connected to that topic.	8.8	32.2	38.0	17.0	3.9	0.2
49. If I do not understand a study text well, I try to find other literature about the subject concerned.	17.5	34.5	31.3	12.8	3.8	0.1
50. If I am able to complete all the assignments given in the study materials or by the teacher, I decide that I have a good command of the subject matter.	8.5	31.0	38.8	16.3	5.3	0.1

PART B: STUDY MOTIVES AND VIEWS ON STUDYING

B1. Study motives

DE: disagree entirely; DM: disagree for the most part; U: undecided; AM: agree for the most part; AE: agree entirely; X: missing value

Instrument Item	DE	DM	U	AM	AE	X
51. When I have a choice, I opt for courses that seem useful to me for my present or future profession.	2.6	11.3	18.7	36.4	31.0	0.1
52. I do these studies out of sheer interest in the topics that are dealt with.	3.1	18.9	32.5	33.6	11.8	0.1
53. I want to prove to myself that I am capable of doing studies in post-secondary education.	5.3	15.5	32.5	32.8	13.6	0.3
54. I doubt whether this is the right subject area for me.	11.2	26.0	36.9	19.8	6.0	0.1
55. I aim at attaining high levels of study achievements.	3.6	12.3	28.9	36.6	18.7	0.1
56. I want to show others that I am capable of successfully doing a post -secondary education programme.	4.9	15.7	28.4	34.3	16.5	0.3
57. I have chosen this subject area, because it prepares me for the type of work I am highly interested in.	4.2	14.4	31.1	34.5	15.8	0.1
58. The main goal I pursue in my studies is to pass exams.	8.5	20.2	24.5	30.6	16.0	0.3

Instrument Item	DE	DM	U	AM	AE	X
59. I view the choice I have made to enrol in post-secondary education as a challenge.	6.5	20.1	36.4	28.0	9.0	0.1
60. The only aim of my studies is to enrich myself.	5.5	20.0	28.8	34.1	11.5	0.1
61. I have little confidence in my study capacities.	8.4	26.0	33.1	23.5	8.8	0.3
62. For the kind of work I would like to do, I need to have studied in post-secondary education.	3.3	12.0	28.7	34.5	21.4	0.1
63. What I want in these studies is to be awarded a certificate/ diploma.	2.9	10.8	21.6	32.3	32.2	0.2
64. I see these studies as sheer relaxation.	17.2	33.9	32.0	13.0	3.8	0.1
65. I study above all to pass the exam.	7.5	20.9	24.4	29.2	17.9	0.1
66. The main goal I pursue in my studies is to prepare myself for a profession.	1.8	8.5	22.3	39.7	27.6	0.1
67. I want to discover my own qualities, the things I am capable and incapable of.	3.6	12.5	32.6	36.6	14.4	0.3
68. What I want to acquire above all through my studies is professional skill.	2.0	7.7	21.4	41.1	27.8	0.1
69. When I have a choice, I opt for courses that suit my personal interests.	1.1	7.9	20.5	39.3	31.0	0.1
70. I wonder whether these studies are worth all the effort.	5.6	15.7	38.0	29.5	11.1	0.1
71. I doubt whether this type of education is the right type of education for me.	6.4	22.4	37.4	23.6	9.9	0.3
72. I want to test myself to see whether I am capable of doing studies in post-secondary education.	7.4	19.0	36.9	29.0	7.4	0.3
73. I do these studies because I like to learn and to study.	9.6	24.1	35.6	24.5	6.1	0.1
74. I am afraid these studies are too demanding for me.	9.7	27.9	38.8	18.2	5.3	0.1
75. To me, the r ecord of having passed an exam represents something of value in itself.	5.2	13.5	32.4	35.5	13.2	0.1

B2. Study views

DE: disagree entirely; DM: disagree for the most part; U: undecided; AM: agree for the most part; AE: agree entirely; X: missing value

Instrument Item	DE	DM	U	AM	AE	X
76. The things I learn have to be useful for solving practical problems.	3.6	16.4	30.7	36.8	12.4	0.1
77. I like to be given precise instructions as to how to go about solving a task or doing an assignment.	1.2	11.0	27.0	43.0	17.8	0.1
78. When I prepare myself for an exam, I prefer to do so together with other students.	12.8	27.2	29.9	24.3	5.6	0.1
79. To me, learning means trying to approach a problem from many different angles, including aspects that were previously unknown to me.	2.7	11.0	31.7	40.9	13.5	0.3
80. To me, learning is making sure that I can reproduce the facts presented in a course.	9.3	28.0	35.5	22.9	4.1	0.1
81. I should look for relationships within the subject matter of my own accord.	3.2	16.0	40.4	34.4	5.9	0.1
82. I like to be encouraged by other students to process the study materials at a particular pace.	6.7	21.6	38.7	27.9	5.1	0.1

Instrument Item	DE	DM	U	AM	AE	X
83. I should try myself to apply the theories dealt with in a course to practical situations.	2.0	11.0	30.5	44.8	11.4	0.3
84. The teacher should encourage me to combine the separate components of a course into a whole.	2.8	12.9	43.6	31.3	9.3	0.1
85. If I have difficulty understanding a particular topic, I should consult other books of my own accord.	3.9	17.3	34.4	36.4	8.0	0.1
86. I prefer to do assignments together with other students.	7.3	18.2	28.1	34.5	11.8	0.1
87. The teacher should explain clearly what is important and what is less important for me to know.	3.3	12.8	31.0	34.2	18.4	0.3
88. I have a preference for courses in which a lot of practical applications of the theoretical parts are given.	4.3	15.6	31.5	34.1	14.4	0.1
89. When I have difficulty understanding something, the teacher should encourage me to find a solution by myself.	4.3	15.4	39.7	32.9	7.5	0.1
90. To me, learning means acquiring knowledge that I can use in everyday life.	3.0	10.5	29.4	39.2	17.8	0.1
91. Good teaching includes giving a lot of questions and exercises to test whether I have mastered the subject matter.	6.1	21.6	36.7	28.8	6.8	0.1
92. To test my own learning progress, I should try to answer questions about the subject matter which I make up myself.	4.4	18.0	41.6	31.5	4.4	0.1
93. The teacher should encourage me to compare the various theories that are dealt with in a course.	2.9	13.1	38.3	38.5	7.0	0.3
94. I prefer a type of instruction in which I am told exactly what I need to know for an exam.	3.4	10.9	25.4	41.1	19.1	0.1
95. I consider it important to be advised by other students as to how to approach my studies.	8.0	21.8	39.4	24.9	5.7	0.2
96. The teacher should encourage me to check myself whether I have mastered the subject matter.	3.4	12.0	33.6	41.6	9.2	0.3
97. To me, learning means acquiring knowledge and skills that I can later apply in practice.	2.2	11.0	26.0	41.1	19.1	0.5
98. I should try to think up examples with the study materials of my own accord.	2.8	12.1	38.1	39.2	7.8	0.1
99. The teacher should encourage me to reflect on the way I study and how to develop my way of studying.	3.1	11.3	33.7	40.7	11.1	0.1
100. I have a need to work together with other students in my studies.	7.4	19.8	31.4	31.0	10.2	0.1

PART C: LEARNING EXPERIENCES

DE: disagree entirely; DM: disagree for the most part; U: undecided; AM: agree for the most part; AE: agree entirely; X: missing value

Instrument Item	DE	DM	U	AM	AE	X
101. It's always easy here to know the standard of work expected.	3.9	18.1	43.2	30.3	4.3	0.1
102. The courses have helped me to develop my problem-solving skills.	2.2	13.8	33.8	43.4	6.6	0.2
103. There are few opportunities to choose the particular areas you want to study.	2.6	16.3	36.4	32.9	11.8	0.1
104. The teachers of the courses motivate students to do their best work.	3.4	14.1	36.3	38.2	7.8	0.2
105. The workload is too heavy.	4.8	21.7	40.4	25.0	8.1	0.1
106. The courses have sharpened my analytic skills.	3.9	16.5	39.1	34.5	5.9	0.1
107. Teachers here frequently give the impression they have nothing to learn from students.	3.3	18.6	49.8	22.9	5.2	0.2
108. You usually have a clear idea of where you're going and what's expected of you.	4.5	23.3	40.7	26.6	4.8	0.1
109. Teachers here put a lot of time into commenting on students' work.	4.9	20.0	43.7	26.4	5.0	0.1
110. To do well on the courses all you really need is a good memory.	1.8	13.5	29.1	38.7	16.8	0.1
111. The courses have helped develop my ability to work as a team member.	2.9	11.1	36.0	41.4	8.5	0.1
112. As a result of doing the courses, I feel more confident about tackling unfamiliar problems.	3.5	14.4	39.3	35.9	6.8	0.2
113. The courses have improved my written communication skills.	4.6	16.2	35.3	35.7	7.9	0.1
114. It seems to me that the syllabuses of the courses try to cover too many topics.	3.8	20.1	41.9	26.7	7.4	0.1
115. The courses have encouraged me to develop my own academic interest as far as possible.	4.5	16.5	36.6	36.2	6.1	0.1
116. Students have a great deal of choice over how they are going to learn in the courses.	4.9	18.9	37.5	32.0	6.5	0.1
117. Teachers seem more interested in testing what you've memorized than what you've understood.	5.5	24.0	38.3	24.2	8.0	0.1
118. It's often hard to discover what's expected of you in the courses.	3.6	18.1	43.2	27.5	7.2	0.5
119. We are generally given enough time to understand the things we have to learn.	6.5	23.2	33.4	31.3	5.4	0.1
120. The teachers make a real effort to understand difficulties students may be having with their work.	4.2	18.1	35.9	35.0	6.7	0.1
121. Students here are given a lot of choice in the work they have to do.	5.0	22.9	42.6	25.1	4.2	0.1
122. Teachers here normally give helpful feedback on how you are going.	3.9	16.0	34.9	38.8	6.4	0.1
123. Our teachers are extremely good at explaining things to us.	4.3	17.4	37.6	34.6	6.0	0.1
124. The aims and objectives of the courses are NOT made very clear.	4.3	25.6	42.7	21.4	6.0	0.1

Instrument Item	DE	DM	U	AM	AE	X
125. Teachers here work hard to make subjects interesting.	5.1	16.5	36.7	35.0	6.5	0.2
126. Too many teachers ask us questions just about facts.	3.9	18.8	52.4	19.6	4.9	0.3
127. There's a lot of pressure on you as a student here.	8.7	26.8	35.8	21.3	7.4	0.1
128. The courses have helped me develop the ability to plan my own work.	3.2	12.3	37.2	39.5	7.6	0.1
129. Feedback on student work is usually provided ONLY in the form of marks and grades.	4.8	20.0	36.6	28.5	10.0	0.2
130. We often discuss with our teachers how we are going to learn in the courses.	8.8	21.6	39.6	25.2	4.3	0.4
131. Teachers here show no real interest in what students have to say.	11.0	36.6	35.8	13.4	3.1	0.1
132. It would be possible to get through the courses just by working hard around exam times.	10.4	24.9	33.9	26.3	4.4	0.3
133. The courses really try to get the best out of all its students.	4.7	19.5	45.5	26.8	3.2	0.3
134. There's very little choice in the courses in the ways you are assessed.	3.4	18.9	47.3	23.3	6.9	0.2
135. The teachers here make it clear right from the start what they expect from students.	4.5	17.2	42.1	31.1	5.1	0.1
136. The sheer volume of work to be got through in the courses means you can't comprehend them all thoroughly.	5.0	22.3	42.7	23.6	6.3	0.2
137.. Overall, I am satisfied with the quality of the courses.	4.3	13.2	35.5	38.8	7.8	0.3

PART D: BACKGROUND INFORMATION

138. Age

18 or below	**40.9**
19	**18.0**
20	**12.3**
21	**11.6**
22	**8.1**
23	**3.9**
24	**1.6**
25 or above	**3.2**
Missing value	**0.3**

139. Sex

Male	**54.8**
Female	**45.0**
Missing value	**0.2**

140. The kind of programme you are studying

Project Yi Jin	**35.0**
One-year Certificate	**13.9**
One-year/Two-year Diploma	**4.4**
Foundation Diploma	**7.0**
Associate Degree	**6.7**
Higher Diploma	**28.2**
Top-up Bachelor's Degree	**4.3**
Others	**0.4**
Missing value	**0.1**

141. Current year of study (Not applicable for one-year programme)

Not Applicable	**59.1**
Two-year Diploma:	
Year 1	**0.9**
Year 2	**3.8**
Associate Degree:	
Foundation Year	**3.2**
Year 1	**3.2**
Year 2	**1.3**
Higher Diploma:	
Year 1	**5.0**
Year 2	**4.9**
Year 3	**6.3**
Year 4	**11.8**
Others	**0.4**
Missing value	**0.1**

142. Major subject area of your programme (Please select one category and one sub-item which come closest to describing your major field of study)

Business Administration / Business Studies:	
Accounting	**18.7**
Corporate Management	**10.6**
Finance	**0.1**
General Application	**3.6**
Other	**1.3**
Hospitality / Tourism:	
Hotel	**17.6**
Food and Beverage	**0.1**
Culinary Arts	**7.8**
Tourism	**8.3**

Other	0.0
Language Studies:	
Translation / Interpretation	4.7
Business Communication	0.0
Other	1.0
Information Technology:	
Computer Studies	15.2
Business Application	2.0
Other	0.0
Social Sciences:	
Social Work	7.0
Other	0.0
Other Category	2.3
Missing value	0.1

143. Number of subjects passed in your previous attempt(s) at the Hong Kong Certificate of Education Examination (HKCEE) [Passes in different years of the same subject should be counted as one]

1 or below	22.0
2	13.8
3	13.9
4	12.5
5 or above	34.9
Never sit for the examination	1.7
Missing value	1.3

144. Overall, I think the programme I am current studying is

Very Easy	1.8
Easy	6.7
Neither Easy Nor Difficult	55.9
Difficult	30.4
Very Difficult	4.8
Missing value	0.4

145. My level of interest in the programme is

Very High	4.9
High	34.1
Medium	51.5
Low	6.6
Very Low	2.5
Missing value	0.4

146. For this academic year, my expected performance in the programme will be

Very Good	**2.8**
Good	**17.3**
Acceptable	**64.4**
Poor	**12.5**
Very Poor	**2.5**
Missing value	**0.4**

147. I permit access to my student record for this study

Yes	**55.1**
No	**44.8**
Missing value	**0.1**

148. If necessary, I agree to be interviewed by the researcher

Yes	**13.0**
No	**87.0**
Missing value	**0.1**

Appendix VI – Analyses of Variance on the Scale Scores of Inventory of Learning Styles

Table A. Results of conducting ANOVAs on the ILS scale scores using institution as factor

ILS Scale	F (5, 1566)	Significance	Eta-squared
Processing Strategy:			
Relating and Structuring	*3.423*	*0.004*	*0.011*
Critical Processing	*4.155*	*0.001*	*0.013*
Memorizing and Rehearsing	*10.264*	*<0.0005*	*0.032*
Analyzing	*4.567*	*<0.0005*	*0.014*
Concrete Processing	*4.522*	*<0.0005*	*0.014*
Regulation Strategy:			
Self-reg.: L. Proc. & Results	2.367	0.038	0.008
Self-reg.: L. Content	*4.123*	*0.001*	*0.013*
External Reg.: L. Processes	*7.144*	*<0.0005*	*0.022*
External Reg. L. Results	*16.962*	*<0.0005*	*0.051*
Lack of Regulation	2.037	0.071	0.006
Mental Model of Learning:			
Construction of Knowledge	*14.410*	*<0.0005*	*0.044*
Intake of Knowledge	*3.882*	*0.002*	*0.012*
Use of Knowledge	*8.009*	*<0.0005*	*0.025*
Stimulating Education	*6.466*	*<0.0005*	*0.020*
Cooperative Learning	1.231	0.292	0.004
Learning Orientation:			
Personally Interested	1.146	0.334	0.004
Certificate-oriented	1.605	0.156	0.005
Self-test-oriented	*5.002*	*<0.0005*	*0.016*
Vocation-oriented	*13.377*	*<0.0005*	*0.041*
Ambivalent	0.811	0.542	0.003

Table B. Results of conducting ANOVAs on the ILS scale scores using programme type as factor

ILS Scale	F (3, 1532)	Significance	Eta-squared
Processing Strategy:			
Relating and Structuring	2.369	0.069	0.005
Critical Processing	0.765	0.514	0.001
Memorizing and Rehearsing	*16.479*	*<0.0005*	*0.031*
Analyzing	1.072	0.360	0.002
Concrete Processing	*7.493*	*<0.0005*	*0.014*
Regulation Strategy:			
Self-reg.: L. Proc. & Results	2.221	0.084	0.004
Self-reg.: L. Content	*4.999*	*0.002*	*0.010*
External Reg.: L. Processes	*7.959*	*<0.0005*	*0.015*
External Reg. L. Results	*25.298*	*<0.0005*	*0.047*
Lack of Regulation	*3.848*	*0.009*	*0.007*
Mental Model of Learning:			
Construction of Knowledge	*28.965*	*<0.0005*	*0.054*
Intake of Knowledge	*6.343*	*<0.0005*	*0.012*
Use of Knowledge	*15.623*	*<0.0005*	*0.030*
Stimulating Education	*12.605*	*<0.0005*	*0.024*
Cooperative Learning	0.349	0.790	0.001
Learning Orientation:			
Personally Interested	0.433	0.729	0.001
Certificate-oriented	0.061	0.980	<0.0005
Self-test-oriented	*8.659*	*<0.0005*	*0.017*
Vocation-oriented	*20.679*	*<0.0005*	*0.039*
Ambivalent	2.066	0.103	0.004

Table C. Results of conducting ANOVAs on the ILS scale scores using subject area as factor			
ILS Scale	F (4, 1531)	Significance	Eta-squared
Processing Strategy:			
Relating and Structuring	*8.182*	*<0.0005*	*0.021*
Critical Processing	*9.196*	*<0.0005*	*0.023*
Memorizing and Rehearsing	*5.992*	*<0.0005*	*0.015*
Analyzing	*5.077*	*<0.0005*	*0.013*
Concrete Processing	*11.908*	*<0.0005*	*0.030*
Regulation Strategy:			
Self-reg.: L. Proc. & Results	*8.030*	*<0.0005*	*0.021*
Self-reg.: L. Content	*15.644*	*<0.0005*	*0.039*
External Reg.: L. Processes	*5.043*	*<0.0005*	*0.013*
External Reg. L. Results	*13.254*	*<0.0005*	*0.033*
Lack of Regulation	*3.663*	*0.006*	*0.009*
Mental Model of Learning:			
Construction of Knowledge	*8.379*	*<0.0005*	*0.021*
Intake of Knowledge	1.026	0.393	0.003
Use of Knowledge	*5.498*	*<0.0005*	*0.014*
Stimulating Education	*5.077*	*<0.0005*	*0.013*
Cooperative Learning	*3.642*	*0.006*	*0.009*
Learning Orientation:			
Personally Interested	*5.414*	*<0.0005*	*0.014*
Certificate-oriented	0.444	0.777	0.001
Self-test-oriented	2.639	0.032	0.007
Vocation-oriented	*7.996*	*<0.0005*	*0.020*
Ambivalent	1.721	0.143	0.004

1. Ajisuksmo, C. R. P. & Vermunt, J. D. (1999) Learning Styles and Self-Regulation of Learning at University: An Indonesian Study. *Asia Pacific Journal of Education*, 19 (2), 45-59.

2. Åkerlind, G. S. (2005) Variation and Commonality in Phenomenographic Research Methods. *Higher Education Research & Development*, 24 (4), 321-334.

3. Anderson, G. (2006) Assuring Quality/Resisting Quality Assurance: Academics' Responses to 'Quality' in Some Australian Universities. *Quality in Higher Education*, 12 (2), 161-173.

4. Babbie, E. (2004) *The Practice of Social Research*, 10th Edition. Belmont: Wadsworth/Thomson Learning.

5. Barnett, R. (1997) Beyond Competence. In F. Coffield and B. Williamson (eds.) *Repositioning Higher Education.* SRHE & Open University Press, 27-44.

6. Barrie, S. & Ginns, P. (2007) The Linking of National Teaching Performance Indicators to Improvements in Teaching and Learning in Classrooms. *Quality in Higher Education*, 13 (3), 275-286.

7. Barrie, S., Ginns, P. & Prosser, M. (2005) Early Impact and Outcomes of An Institutionally Aligned, Student Focused Learning Perspective on Teaching Quality Assurance. *Assessment & Evaluation in Higher Education*, 30 (6), 641-656.

8. Battistich, V., Solomon, D., Watson, M. & Schaps, E. (1997) Caring School Communities. *Educational Psychologist*, 32 (3), 137-151.

9. Biggs, J. (1987) *The Study Process Questionnaire (SPQ): Manual.* Victoria: Australia Council for Educational Research.

10. Biggs, J. (2003) *Teaching for Quality Learning at University: What the Students Does*, 2nd Edition. Buckingham: SRHE & Open University Press.

11. Biggs, J., Kember, D. & Leung, D. Y. P. (2001) The Revised Two-factor Study Process Questionnaire: R-SPQ-2F. *British Journal of Educational Psychology*, 71, 133-149.

12. Blackmore, J. (2002) Globalization and the Restructuring of Higher Education for New Knowledge Economies: New Dangers or Old Habits Troubling Gender Equity Work in Universities? *Higher Education Quarterly*, 56 (4), 419-441.

13. Blackmur, D. (2004) A Critique of the Concept of a National Qualifications Framework. *Quality in Higher Education*, 10 (3), 267-284.

14. Boekaerts, M. (1995) Self-Regulated Learning: Bridging the Gap Between Metacognitive and Metamotivation Theories. *Educational Psychologist*, 30 (4), 195-200.

15. Boekaerts, M. (1997) Self-Regulated Learning: A New Concept Embraced by Researchers, Policy Makers, Educators, Teachers, and Students. *Learning and Instruction*, 7 (2), 161-186.

16. Bogue, E. G. (1998) Quality Assurance in Higher Education: The Evolution of Systems and Design Ideals. *New Directions for Institutional Research*, 99, 7-18.

17. Boyle, E. A., Duffy, T. & Dunleavy, K. (2003) Learning Styles and Academic Outcome: The Validity and Utility of Vermunt's Inventory of Learning Styles in a British Higher Education Setting. *British Journal of Educational Psychology*, 73, 267-290.

18. Bramming, P. (2007) An Argument for Strong Learning in Higher Education. *Quality in Higher Education*, 45-56.

19. Brennan, J., Brighton, R., Moon, N., Richardson, J., Rindl, J. & Williams, R. (2004) *Collecting and Using Student Feedback on Quality and Standards of Learning and Teaching in Higher Education: A Report to Higher Education Funding Council for England*. SQW Limited, The Open University and NOP Research Group.

20. Brown, T. J., Churchill, G. A. & Peter, J. P. (1993) Improving the Measurement of Service Quality. *Journal of Retailing*, 69 (1), 127-139.

21. Bryman, A. & Cramer, D. (2005/2006) *Quantitative Data Analysis with SPSS 12 and 13*. Routledge.

22. Busato, V. V., Prins, F. J., Elshout, J. J. & Hamaker, C. (1998) Learning Styles: A Cross-Sectional and Longitudinal Study in Higher Education. *British Journal of Educational Psychology*, 68, 427-441.

23. Byrne, M. & Flood, B. (2003) Assessing the Teaching Quality of Accounting Programmes: An Evaluation of the Course Experience Questionnaire. *Assessment & Evaluation in Higher Education*, 28 (2), 135-145.

24. Carmichael, R., Palermo, J., Reeve, L. & Vallence, K. (2001) Student Learning: 'The Heart of Quality' in Education and Training. *Assessment & Evaluation in Higher Education*, 26 (5), 449-463.

25. Cheng, D. X. (2001) Assessing Student Collegiate Experience: Where Do We Begin? *Assessment & Evaluation in Higher Education*, 26 (6), 525-538.

26. Cheng, Y. C. & Tam, W. M. (1997) Multi-Models of Quality in Education. *Quality Assurance in Education*, 5 (1), 22-34.

27. Clewes, D. (2003) A Student-Centred Conceptual Model of Service Quality in Higher Education. *Quality in Higher Education*, 9 (1), 69-85.

28. Coffield, F. & Williamson, B. (1997) The Challenges Facing Higher Education. In F. Coffield and B. Williamson (eds.) *Repositioning Higher Education*. SRHE & Open University Press, 1-26.

29. Cohen, J. (1992) A Power Primer. *Psychological Bulletin*, 112 (1), 150-159.

30. Cohen, J., Cohen, P., West, S. G. & Aiken, L. S. (2003) *Applied Multiple Regression/Correction Analysis for the Behavioral Sciences*, 3rd Edition. Lawrence Erlbaum Associates, Inc.

31. Cortina, J. M. (1993) What is Coefficient Alpha? An Examination of Theory and Applications. *Journal of Applied Psychology*, 78 (1), 98-104.

32. Costello, A. B. & Osborne, J. W. (2005) Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most from Your Analysis. *Practical Assessment, Research & Evaluation*, 10 (7), 1-9.

33. Danaher, P. A., Bowser, D. & Somasundaram, J. (2008) The Student Departure Puzzle: Do Some Faculties and Programs Have Answers? *Higher Education Research & Development*, 27 (3), 271-280.

34. Deming, W. E. (1986) *Out of the Crisis*, Massachusetts: M.I.T., Centre for Advanced Engineering Study.

35. Dill, D. D. (1995) Through Deming's Eyes: A Cross-National Analysis of Quality Assurance Policies in Higher Education. *Quality in Higher Education*, 1 (2), 95-110.

36. Dill, D. D. (2000) Designing Academic Audit: Lessons Learned in Europe and Asia. *Quality in Higher Education*, 6 (3), 187-207.

37. Douglas, J. & Douglas, A. (2006) Evaluating Teaching Quality. *Quality in Higher Education*, 12 (1), 3-13.

38. EC (1999) *Learning for Life*. Education Commission, Hong Kong Special Administrative Region Government.

39. EC (2002) *Progress Report on the Education Reform (1)*. Education Commission, Hong Kong Special Administrative Region Government.

40. EDB (2008) *Report of the Phase Two Review of the Post Secondary Education Sector*. Steering Committee – Review of the Post Secondary Education Sector, Education Bureau, Hong Kong Special Administrative Region Government, April 2008.

41. Ekeblad, E. (1997) On the Surface of Phenomenography: A Response to Graham Webb. *Higher Education*, 33, 219-224.

42. Eley, M. (2001) The Course Experience Questionnaire: Altering Question Format and Phrasing Could Improve the CEQ's Effectiveness. *Higher Education Research & Development*, 20 (3), 293-312.

43. Elliott, K. M. & Shin, D. (2002) Student Satisfaction: An Alternative Approach to Assessing This Important Concept. *Journal of Higher Education Policy and Management*, 24 (2), 197-209.

44. EMB (2002) *Consultation Paper on the Proposal to Set Up a Qualifications Framework and the Associated Quality Assurance in Hong Kong.* Education and Manpower Bureau, Hong Kong Special Administrative Region Government, November 2002.

45. EMB (2006) *Review of the Post-secondary Education Sector.* Education and Manpower Bureau, Hong Kong Special Administrative Region Government, March 2006.

46. Entwistle, N. (1997) Reconstituting Approaches to Learning: A Response to Webb. *Higher Education*, 33, 213-218.

47. Entwistle, N. & McCune, V. (2004) The Conceptual Bases of Study Strategy Inventories. *Educational Psychology Review*, 16 (4), 325-345.

48. Field, A. (2000/2002) *Discovering Statistics: Using SPSS for Windows.* London: SAGE Publications Ltd.

49. Fitz-Gibbon, C. T. (1996) *Monitoring Education: Indicators, Quality and Effectiveness.* London and New York: Continuum.

50. GCCA (2004) *Course Experience Questionnaire 2003: A National Survey of the Activities of Year 2002 University Graduates.* Graduate Careers Council of Australia.

51. Geall, V. (2000) The Expectations and Experience of First-Year Students at City University of Hong Kong. *Quality in Higher Education*, 6 (1), 77-89.

52. Gibbs, G., Morgan, A. & Taylor, E. (1984) The World of the Learner. In F. Marton, D. Hounsell and N. Entwistle (eds.) *The Experience of Learning.* Scottish Academic Press, Edinburgh, 165-188.

53. Gibbs, P. (2001) Higher Education as a Market: A Problem or Solution? *Studies in Higher Education*, 26 (1), 85-94.

54. Ginns, P., Prosser, M. & Barrie, S. (2007) Students' Perceptions of Teaching Quality in Higher Education: The Perspective of Currently Enrolled Students. *Studies in Higher Education*, 32 (5), 603-615.

55. Grant, D., Mergen, E. & Widrick, S. (2002) Quality Management in US Higher Education. *Total Quality Management*, 13 (2), 207-215.

56. Haggis, T. (2003) Constructing Images of Ourselves? A Critical Investigation into 'Approaches to Learning' Research in Higher Education. *British Educational Research Journal*, 29 (1), 89-104.

57. Harker, B. (1995) Postmodernism and Quality. *Quality in Higher Education*, 1 (1), 31-39.

58. Harvey, L. (1995) Beyond TQM. *Quality in Higher Education*, 1 (2), 123-146.

59. Harvey, L. (2002a) Evaluation for What? *Teaching in Higher Education*, 7 (3), 245-263.

60. Harvey, L. (2002b) The End of Quality? *Quality in Higher Education*, 8 (1), 5-22.

61. Harvey, L. (2003) Student Feedback. *Quality in Higher Education*, 9 (1), 3-20.

62. Harvey, L. (2004) The Power of Accreditation: Views of Academics. *Journal of Higher Education Policy and Management*, 26 (2), 207-223.

63. Harvey, L. (2006) Impact of Quality Assurance: Overview of a Discussion between Representatives of External Quality Assurance Agencies. *Quality in Higher Education*, 12 (3), 287-290.

64. Harvey, L. & Green, D. (1993) Defining Quality. *Assessment & Evaluation in Higher Education*, 18 (1), 9-34.

65. Harvey, L. & Knight, P. T. (1996) *Transforming Higher Education*. Buckingham: SRHE & Open University Press.

66. Harvey, L. & Newton, J. (2004) Transforming Quality Evaluation. *Quality in Higher Education*, 10 (2), 149-165.

67. HEFCE (2007) *Review of Performance Indicators: Outcomes and Decisions*. Higher Education Funding Council for England, June 2007/14.

68. HKCAAVQ (2008a) *Guidelines on Four-Stage Quality Assurance Process under the Qualifications Framework: QF Levels 1 to 3*, Version 1.0, May 2008. Hong

Kong Council for Accreditation of Academic and Vocational Qualifications. URL: http://hkcaavq.edu.hk/fourstage/FourstageQAmodel1-3_e.pdf [30 June 2008].

69. HKCAAVQ (2008b) *Guidelines on Four-Stage Quality Assurance Process under the Qualifications Framework: QF Levels 4 to 7*, Version 1.0, May 2008. Hong Kong Council for Accreditation of Academic and Vocational Qualifications. URL: http://hkcaavq.edu.hk/fourstage/FourstageQAmodel4-7_e.pdf [30 June 2008].

70. HKUGC (2005) *Education Quality Work: The Hong Kong Experience – A Handbook on Good Practices in Assuring and Improving Teaching and Learning Quality*. The University Grants Committee of Hong Kong.

71. Hoecht, A. (2006) Quality Assurance in UK Higher Education: Issues of Trust, Control, Professional Autonomy and Accountability. *Higher Education*, 51, 541-563.

72. Horsburgh, M. (1999) Quality Monitoring in Higher Education: The Impact on Student Learning. *Quality in Higher Education*, 5 (1), 9-25.

73. Houston, D. (2007) TQM and Higher Education: A Critical Systems Perspective on Fitness for Purpose. *Quality in Higher Education*, 13 (1), 3-17.

74. Jones, J. & De Saram, D. D. (2005) Academic Staff Views of Quality Systems for Teaching and Learning: A Hong Kong Case Study. *Quality in Higher Education*, 11 (1), 47-58.

75. Juvonen, J. (2007) Reforming Middle Schools: Focus on Continuity, Social Connectedness, and Engagement. *Educational Psychologist*, 42 (4), 197-208.

76. Kanji, G. K. & Bin Al Tambi, A. M. (1999) Total Quality Management in UK Higher Education Institutions. *Total Quality Management*, 10 (1), 129-153.

77. Kember, D. (2000) Misconceptions about the Learning Approaches, Motivation and Study Practices of Asian Students. *Higher Education*, 40, 99-121.

78. Kember, D. & Leung, D. Y. P. (1998) The Dimensionality of Approaches to Learning: An Investigation with Confirmatory Factor Analysis on the Structure of the SPQ and LPQ. *British Journal of Educational Psychology*, 68, 395-407.

79. Kember, D., Hong, C. & Ho, A. (2008) Characterizing the Motivational Orientation of Students in Higher Education: A Naturalistic Study in Three Hong Kong Universities. *British Journal of Educational Psychology*, 78, 313-329.

80. Kember, D., Leung, D. Y. P. & Kwan, K. P. (2002) Does the Use of Student Feedback Questionnaires Improve the Overall Quality of Teaching? *Assessment & Evaluation in Higher Education*, 27 (5), 411-425.

81. Kember, D., Ng, S., Tse, H. & Wong, E. T. T. (1996) An Examination of the Interrelationships between Workload, Study Time, Learning Approaches and Academic Outcomes. *Studies in Higher Education*, 21 (3), 347-358.

82. Kember, D., Wong, A. & Leung, D. Y. P. (1999) Reconsidering the Dimensions of Approaches to Learning. *British Journal of Educational Psychology*, 69, 325-343.

83. Kennedy, E. & Mandeville, G. (2000) Some Methodological Issues in School Effectiveness Research. In C. Teddlie and D. Reynolds (eds.) *The International Handbook of School Effectiveness Research*. New York and London: RoutledgeFalmer, 189-205.

84. Knight, P. T. (2002) The Achilles' Heel of Quality: The Assessment of Student Learning. *Quality in Higher Education*, 8 (1), 107-115.

85. Koch, J. V. (2003) TQM: Why Is Its Impact in Higher Education So Small? *The TQM Magazine*, 15 (5), 325-333.

86. Koch, J. V. & Fisher, J. L. (1998) Higher Education and Total Quality Management. *Total Quality Management*, 9 (8), 659-668.

87. Kolitch, E. & Dean, A. V. (1999) Student Ratings of Instruction in the USA: Hidden Assumptions and Missing Conceptions about 'Good' Teaching. *Studies in Higher Education*, 24 (1), 27-42.

88. Kreber, C. (2003) The Relationship between Students' Course Perception and Their Approaches to Studying in Undergraduate Science Courses: A Canadian Experience. *Higher Education Research & Development*, 22 (1), 57-75.

89. Kuh, G. D. (2001a) *The National Survey of Student Engagement: Conceptual Framework and Overview of Psychometric Properties*. Indiana University Center

for Postsecondary Research and Planning, Bloomington, Indiana, USA. URL: http://nsse.iub.edu/html/psychrometric_framework_ 2002.cfm [13 March 2008].

90. Kuh, G. D. (2001b) Assessing What Really Matters to Student Learning: Inside The National Survey of Student Engagement. *Change*, May/June 2001, 10-17 & 66.

91. Kuh, G. D. (2003) What We're Learning about Student Engagement from NSSE: Benchmarks for Effective Educational Practices. *Change*, March/April 2003, 24-32.

92. Lawless, C. J. & Richardson, J. T. E. (2002) Approaches to Studying and Perceptions of Academic Quality in Distance Education. *Higher Education*, 44, 257-282.

93. Leckey, J. & Neill, N. (2001) Quantifying Quality: The Importance of Student Feedback. *Quality in Higher Education*, 7 (1), 19-32.

94. Lemaitre, M. J. (2002) Quality as Politics. *Quality in Higher Education*, 8 (1), 19-37.

95. Leong, J. C. Y. & Wong, W. S. (2004) The Accreditation and Quality Assurance of Sub-degree/Degree Qualifications in the Establishment of a Hong Kong Qualifications Framework: Local, Regional and Transnational Implications. *Quality in Higher Education*, 10 (1), 43-49.

96. Lizzio, A. & Wilson, K. (2004) First-Year Students' Perceptions of Capability. *Studies in Higher Education*, 29 (1), 109-128.

97. Lizzio, A., Wilson, K. & Simons, R. (2002) University Students' Perceptions of the Learning Environment and Academic Outcomes: Implications for Theory and Practice. *Studies in Higher Education*, 27 (1), 27-52.

98. Lomas, L. (2002) Does the Development of Mass Education Necessarily Mean the End of Quality? *Quality in Higher Education*, 8 (1), 71-79.

99. Lomas, L. (2007) Are Students Customers? Perceptions of Academic Staff. *Quality in Higher Education*, 13 (1), 31-44.

100. Lonka, K., Olkinuora, K. & Mäkinen, J. (2004) Aspects and Prospects of Measuring Studying and Learning in Higher Education. *Educational Psychology Review*, 16 (4), 301-323.

101. MacDonald, M., Williams, J., Kane, D., Gorman, P., Smith, E., Sagu, S. & Cappuccini-Ansfield, G. (2007) *The 2007 Report on the Student Experience at UCE Birmingham*. Centre for Research into Quality, University of Central England.

102. Marsh, H. W. (1987) Students' Evaluations of University Teaching: Research Findings, Methodological Issues, and Direction for Future Research. *International Journal of Educational Research*, 11, 253-388.

103. Marsh, H. W. & Roche, L. (1993) The Use of Students' Evaluations and an Individually Structured Intervention to Enhance University Teaching Effectiveness. *American Educational Research Journal*, 30 (1), 217-251.

104. Martin, J. (2004) Self-Regulated Learning, Social Cognitive Theory, and Agency. *Educational Psychologist*, 39 (2), 135-145.

105. Marton, F. & Säljö, R. (1976a) On Qualitative Differences in Learning: I. Outcome and Process. *British Journal of Educational Psychology*, 46, 4-11.

106. Marton, F. & Säljö, R. (1976b) On Qualitative Differences in Learning: II. Outcome as a Function of the Learner's Conception of the Task. *British Journal of Educational Psychology*, 46, 115-127.

107. Marton, F. & Säljö, R. (1984) Approaches to Learning. In F. Marton, D. Hounsell and N. Entwistle (eds.) *The Experience of Learning*. Scottish Academic Press, Edinburgh, 36-55.

108. Marton, F., Dall'Alba, G. & Tse, K. L. (1996) Memorizing and Understanding: The Keys to the Paradox? In D. A. Watkins and J. B. Biggs (eds.) *The Chinese Learner: Cultural, Psychological and Contextual Influences*. Hong Kong: CERC & ACER, 69-83.

109. Marton, F., Watkins, D. & Tang, C. (1997) Discontinuities and Continuities in the Experience of Learning: An Interview Study of High-School Students in Hong Kong. Learning and Instruction, 7 (1), 21-48.

110. Massy, W. F. (1997) Teaching and Learning Quality-Process Review: The Hong Kong Programme. *Quality in Higher Education*, 3 (3), 249-262.

111. Massy, W. F. (2001) *Applying Business Quality Principles to Academic Audit: Hong Kong's Second-Round TLQPR*. Hong Kong University Grants Committee. URL: http://www.ugc.edu.hk/eng/ugc/publication/prog/tlqpr/bangelor.htm [24 September 2008].

112. Massy, W. F. & French, N. J. (2001) Teaching and Learning Quality Process Review: What the Programme Has Achieved in Hong Kong. *Quality in Higher Education*, 7 (1), 33-45.

113. Meyer, J. H. F. (1991) Study Orchestration: the Manifestation, Interpretation and Consequences of Contextualised Approaches to Studying. *Higher Education*, 22, 297-316.

114. Meyer, J. H. F. (1999) Variation and Concepts of Quality in Student Learning. *Quality in Higher Education*, 5 (2), 167-180.

115. Meyer, J. H. F. (2000) The Modeling of 'Dissonant' Study Orchestration in Higher Education. *European Journal of Psychology of Education*, 15, 5-18.

116. Meyer, J. H. F. (2004a) *Variation in Student Learning: An Empirical Nested Model*. Centre for Learning, Teaching and Research in Higher Education, University of Durham.

117. Meyer, J. H. F. (2004b) An Introduction to the RoLI. *Innovations in Education and Teaching International*, 41 (4), 491-497.

118. Meyer, J. H. F. & Eley, M. G. (2006) The Approaches to Teaching Inventory: A Critique of Its Development and Applicability. *British Journal of Educational Psychology*, 76, 633-649.

119. Meyer, J. H. F. & Muller, M. W. (1990) Evaluating the Quality of Student Learning. I – An Unfolding Analysis of the Association between Perceptions of Learning Context and Approaches to Studying at an Individual Level. *Studies in Higher Education*, 15 (2), 131-154.

120. Meyer, J. H. F. & Watson, R. M. (1991) Evaluating the Quality of Student Learning. II – Study Orchestration and the Curriculum. *Studies in Higher Education*, 16 (3), 251-275.

121. Meyer, J. H. F., Dunne, T. T. & Richardson, J. T. E. (1994) A Gender Comparison of Contextualised Study Behaviour in Higher Education. *Higher Education*, 27 (4), 469-485.

122. Middlehurst, R. (1997) Enhancing Quality. In F. Coffield and B. Williamson (eds.) *Repositioning Higher Education.* SRHE & Open University Press, 45-56.

123. Morley, L. (2003) *Quality and Power in Higher Education.* England: SRHE & Open University Press.

124. Newton, J. (2000) Feeding the Beast or Improving Quality?: Academics' Perceptions of Quality Assurance and Quality Monitoring. *Quality in Higher Education*, 6 (2), 153-163.

125. Newton, J. (2002) Views from Below: Academics Coping with Quality. *Quality in Higher Education*, 8 (1), 39-61.

126. Newton, J. (2003) Implementing an Institutional-Wide Learning and Teaching Strategy: Lessons in Managing Change. *Studies in Higher Education,* 28 (4), 427-442.

127. Norušis, M. J. (2006) *SPSS 14.0 Guide to Data Analysis*. Prentice Hall.

128. NSSE (2006) *Engaged Learning: Fostering Success for All Students - Annual Report 2006, National Survey of Student Engagement.* Center for Postsecondary Research, School of Education, Indiana University, Bloomington.

129. Parasuraman, A., Zeithaml, V. & Berry, L. (1985) A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, 49, 41-50.

130. Parasuraman, A., Zeithaml, V. & Berry, L. (1988) SERVQUAL: A Multi-Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, 64 (1), 12-40.

131. Parasuraman, A., Berry, L. & Zeithaml, V. (1991) Refinement and Reassessment of the SERVQUAL Scale. *Journal of Retailing*, 67 (4), 420-450.

132. Parasuraman, A., Berry, L. & Zeithaml, V. (1993) More on Improving Service Quality Measurement. *Journal of Retailing*, 69 (1), 140-147.

133. Pascarella, E. T. (2001) Identifying Excellence in Undergraduate Education: Are We Even Close? *Change*, May/June 2001, 19-23.

134. Pascarella, E. T. & Terenzini, P. T. (1991) *How College Affects Students: Findings and Insights from Twenty Years of Research.* San Francisco: Jossey-Bass.

135. Pascarella, E. T. & Terenzini, P. T. (1998) Studying College Students in the 21st Century: Meeting New Challenges. *Review of Higher Education*, 21, 151-165.

136. Pascarella, E. T. & Terenzini, P. T. (2005) *How College Affects Students, Volume 2: A Third Decade of Research.* San Francisco: Jossey-Bass.

137. Peters, M. (2004) Higher Education, Globalization and the Knowledge Economy. In M. Walker and J. Nixon (eds.) *Reclaiming Universities from a Runaway World.* SRHE & Open University Press, 67-82.

138. Pintrich, P. R. (2000a) Educational Psychology at the Millennium: A Look Back and A Look Forward. *Educational Psychologist*, 35 (4), 221-226.

139. Pintrich, P. R. (2000b) The Role of Goal Orientation in Self-Regulated Learning. In M. Boekaerts, P.R. Pintrich and M. Zeidner (eds.) *Handbook of Self-Regulation*, Academic Press, San Diego, CA, 451-502.

140. Pintrich, P. R. (2004) A Conceptual Framework for Assessing Motivation and Self-Regulated Learning in College Students. *Educational Psychology Review*, 16 (4), 385-407.

141. Pires da Rosa, M. J., Saraiva, P. M. & Diz, H. (2001) The Development of An Excellence Model for Portuguese Higher Education Institutions. *Total Quality Management*, 12 (7&8), 1010-1017.

142. Popli, S. (2005) Ensuring Customer Delight: A Quality Approach to Excellence in Management Education. *Quality in Higher Education*, 11 (1), 17-24.

143. Prosser, M. & Trigwell, K. (1999/2000) *Understanding Learning and Teaching: The Experience in Higher Education*. Buckingham: SRHE and Open University Press.

144. Ramsden, P. (1979) Student Learning and Perceptions of the Academic Environment. *Higher Education*, 8, 411-428.

145. Ramsden, P. (1991a) A Performance Indicator of Teaching Quality in Higher Education: The Course Experience Questionnaire. *Studies in Higher Education*, 16 (2), 129-150.

146. Ramsden, P. (1991b) Report on the Course Experience Questionnaire Trial. In R. D. Linke (ed.) *Performance Indicators in Higher Education: Report of a Trial Evaluation Study Commissioned by the Commonwealth Department of Employment, Education and Training. Volume 2: Supplementary Papers* (Canberra, Australian Government Publishing Service).

147. Ramsden, P. (2003) *Learning to Teach in Higher Education*, 2nd Edition. London and New York: RoutledgeFalmer.

148. Reason, R. D., Terenzini, P. T. & Domingo, R. J. (2007) Developing Social and Personal Competence in the First Year of College. *Review of Higher Education*, 30 (3), 271-299.

149. Rhodes, C. & Nevill, A. (2004) Academic and Social Integration in Higher Education: A Survey of Satisfaction and Dissatisfaction within a First-Year Education Studies Cohort at A New University. *Journal of Further and Higher Education*, 28 (2), 179-193.

150. Richardson, J. T. E. (1994a) Cultural Specificity of Approaches to Studying in Higher Education: A Literature Survey. *Higher Education*, 27 (4), 449-468.

151. Richardson, J. T. E. (1994b) A British Evaluation of the Course Experience Questionnaire. *Studies in Higher Education*, 19 (1), 59-68.

152. Richardson, J. T. E. (2000) *Researching Student Learning: Approaches to Studying in Campus-Based and Distance Education*. Buckingham: SRHE & Open University Press.

153. Richardson, J. T. E. (2004) Methodological Issues in Questionnaire-Based Research on Student Learning in Higher Education. *Educational Psychology Review*, 16 (4), 347-358.

154. Richardson, J. T. E. (2005a) Instruments for Obtaining Student Feedback: A Review of the Literature. *Assessment & Evaluation in Higher Education*, 30 (4), 387-415.

155. Richardson, J. T. E. (2005b) Students' Approaches to Learning and Teachers' Approaches to Teaching in Higher Education. *Educational Psychology*, 25 (6), 673-680.

156. Richardson, J. T. E. (2005c) Students' Perceptions of Academic Quality and Approaches to Studying in Distance Education. *British Educational Research Journal*, 31 (1), 7-27.

157. Richardson, J. T. E. (2006) Investigating the Relationship between Variations in Students' Perceptions of Their Academic Environment and Variations in Study Behaviour in Distance Learning. *British Journal of Educational Psychology*, 76, 867-893.

158. Richardson, J. T. E. (2007) Motives, Attitudes and Approaches to Studying in Distance Learning. *Higher Education*, 54, 385-416.

159. Richardson, J. T. E., Slater, J. B. & Wilson, J. (2007) The National Student Survey: Development, Findings and Implications. *Studies in Higher Education*, 32 (5), 557-580.

160. Robinson, S. (1999) Measuring Service Quality: Current Thinking and Future Requirements. *Marketing Intelligence & Planning*, 17 (1), 21-32.

161. Rowley, J. (1995) Student Feedback: A Shaky Foundation for Quality Assurance. *Innovation and Learning in Education*, 1 (3), 14-20.

162. Rowley, J. (1996) Measuring Quality in Higher Education. *Quality in Higher Education*, 2 (3), 237-255.

163. Rowley, J. (1997) Beyond Service Quality Dimensions in Higher Education and Towards a Service Contract. *Quality Assurance in Education*, 5 (1), 7-14.

164. Rowley, J. (2003) Designing Student Feedback Questionnaires. *Quality Assurance in Education*, 11 (3), 142-149.

165. Sadlo, G. & Richardson, J. T. E. (2003) Approaches to Studying and Perceptions of the Academic Environment in Students Following Problem-Based and Subject-Based Curricula. *Higher Education Research & Development*, 22 (3), 253-274.

166. Salomon, G. (1995) Reflections on the Field of Educational Psychology by the Outgoing Journal Editor. *Educational Psychologist*, 30 (3), 105-108.

167. Saunders, L. (1999) A Brief History of Educational 'Value Added': How Did We Get to Where We Are? *School Effectiveness and School Improvement*, 10 (2), 233-256.

168. Severiens, S. & Ten Dam, G. (1997) Gender and Gender Identity Differences in Learning Styles. *Educational Psychology*, 17 (1 & 2), 79-93.

169. Srikanthan, G. & Dalrymple J. F. (2002) Developing a Holistic Model for Quality in Higher Education. *Quality in Higher Education*, 8 (3), 215-224.

170. Srikanthan, G. & Dalrymple, J. (2005) Implementation of a Holistic Model for Quality in Higher Education. *Quality in Higher Education*, 11 (1), 69-81.

171. Surridge, P. (2008) *The National Student Survey 2005-2007: Findings and Trends – A Report to The Higher Education Funding Council for England*. July 2008.

172. Sutherland, S. R. (2002) *Higher Education in Hong Kong: Report of the University Grants Committee*. The University Grants Committee of Hong Kong.

173. Svensson, L. (1997) Theoretical Foundations of Phenomenography. *Higher Education Research & Development*, 16 (2), 159-171.

174. Swan, J. E. & Bowers, M. R. (1998) Services Quality and Satisfaction: The Process of People Doing Things Together. *Journal of Services Marketing*, 12 (1), 59-72.

175. Tam, M. (1999a) Quality Assurance Policies in Higher Education in Hong Kong. *Journal of Higher Education Policy and Management*, 21 (2), 215-226.

176. Tam, M. (1999b) Managing Change Involves Changing Management: Implications for Transforming Higher Education. *Quality in Higher Education*, 5 (3), 227-232.

177. Tam, M. (2001a) Measuring Quality and Performance in Higher Education. *Quality in Higher Education*, 7 (1), 47-54.

178. Tam, M. (2001b) *Assessing Quality in Higher Education by Examining the Effects of University Experiences on Learning Outcomes and Student Development.* Thesis for Doctor of Education. University of Durham.

179. Tam, M. (2004) Using Students' Self-reported Gains as a Measure of Value-added. *Quality in Higher Education*, 10 (3), 253-260.

180. Tang, C. (1996) Collaborative Learning: The Latent Dimension in Chinese Students' Learning. In D. A. Watkins and J. B. Biggs (eds.) *The Chinese Learner: Cultural, Psychological and Contextual Influences*. Hong Kong: CERC & ACER, 183-204.

181. Teddlie, C. & Reynolds, D. (eds.) (2000) *The International Handbook of School Effectiveness Research.* New York and London: RoutledgeFalmer.

182. Tinto, V. (1993) *Leaving College: Rethinking the Causes and Cures of Student Attrition*, 2nd Edition. Chicago: University of Chicago Press.

183. Tinto, V. (1997) Classrooms as Communities: Exploring the Educational Character of Student Persistence. *Journal of Higher Education*, 68 (6), 599-623.

184. Tinto, V. (2005) Reflections on Retention and Persistence: Institutional Actions on Behalf of Student Persistence. *Studies in Learning, Evaluation Innovation and Development*, 2 (3), 89-97. URL: http://sleid.cqu.edu.au [31 January 2009].

185. Trigwell, K. & Prosser, M. (1991) Improving the Quality of Student Learning: The Influence of Learning Context and Student Approaches to Learning on Learning Outcomes. *Higher Education*, 22, 251-266.

186. Trigwell, K. & Prosser, M. (1997) Towards an Understanding of Individual Act of Teaching and Learning. *Higher Education Research & Development*, 16, 241-252.

187. Trigwell, K. & Prosser, M. (2004) Development and Use of the Approaches to Teaching Inventory. *Educational Psychology Review*, 16 (4), 409-424.

188. Tymms, P. (1999/2000) *Baseline Assessment and Monitoring in Primary Schools: Achievements, Attitudes and Value-added Indicators*. London: David Fulton Publishers.

189. Van Kemenade, E., Pupius, M. & Hardjono, T. W. (2008) More Value to Defining Quality. *Quality in Higher Education*, 14 (2), 175-185.

190. Vermetten, Y. J., Lodewijks, H. G. & Vermunt, J. D. (1999a) Consistency and Variability of Learning Strategies in Different University Courses. *Higher Education*, 37, 1-21.

191. Vermetten, Y. J., Vermunt, J. D. & Lodewijks, H. G. (1999b) A Longitudinal Perspective on Learning Strategies in Higher Education – Different View-points towards Development, *British Journal of Educational Psychology*, 69 (2), 221-242.

192. Vermunt, J. D. (1996) Metacognitive, Cognitive and Affective Aspects of Learning Styles and Strategies: A Phenomenographic Analysis. *Higher Education*, 31, 25-50.

193. Vermunt, J. D. (1998) The Regulation of Constructive Learning Processes. *British Journal of Educational Psychology*, 68, 149-171.

194. Vermunt, J. D. (2005) Relations between Student Learning Patterns and Personal and Contextual Factors and Academic Performance. *Higher Education*, 49, 205-234.

195. Vermunt, J. D. & Minnaert, A. (2003) Dissonance in Student Learning Patterns: When to Revise Theory? *Studies in Higher Education*, 28 (1), 49-61.

196. Vermunt, J. D. & Verloop, N. (1999) Congruence and Friction between Learning and Teaching. *Learning and Instruction*, 9, 257-280.

197. Vermunt, J. D. & Verloop, N. (2000) Dissonance in Students' Regulation of Learning Processes. *European Journal of Psychology of Education*, 15, 75-89.

198. Vermunt, J. D. & Vermetten, Y. J. (2004) Patterns in Student Learning: Relationships between Learning Strategies, Conceptions of Learning, and Learning Orientations. *Educational Psychology Review*, 16 (4), 359-384.

199. Volet, S. (2001a) Understanding Learning and Motivation in Context: A Multi-dimensional and Multi-level Cognitive-Situative Perspective. In S. Volet and S. Järvelä (eds.) *Motivation in Learning Contexts: Theoretical Advances and Methodological Implications*, Elsevier Science Ltd., 57-82.

200. Volet, S. (2001b) Emerging Trends in Recent Research on Motivation in Learning Contexts. In S. Volet and S. Järvelä (eds.) *Motivation in Learning Contexts: Theoretical Advances and Methodological Implications*, Elsevier Science Ltd., 319-334.

201. Wachtel, H. K. (1998) Student Evaluation of College Teaching Effectiveness: A Brief Review. *Assessment & Evaluation in Higher Education*, 23 (2), 191-211.

202. Watkins, D. A. & Biggs, J. B. (eds.) (1996) *The Chinese Learner: Cultural, Psychological and Contextual Influences*. Hong Kong: CERC & ACER.

203. Webb, G. (1997a) Deconstructing Deep and Surface: Towards a Critique of Phenomenography. *Higher Education*, 33, 195-212.

204. Webb, G. (1997b) Contesting Learning Theory: A Response to Entwistle and Ekeblad. *Higher Education*, 33, 225-230.

205. Westermann, R., Spies, K., Heise, E. & Wollburg-Claar, S. (2002) Student Evaluation of Instruction and Study Conditions. *European Education*, 34 (1), 44-69.

206. Wiers-Jenssen, J., Stensaker, B. & GrØgaard, J. B. (2002) Student Satisfaction: Towards an Empirical Deconstruction of the Concept. *Quality in Higher Education*, 8 (2), 183-195.

207. Williams, G. (1993) Total Quality Management in Higher Education: Panacea or Placebo? *Higher Education*, 25 (3), 229-237.

208. Williamson, B. & Coffield, F. (1997) Repositioning Higher Education. In F. Coffield and B. Williamson (eds.) *Repositioning Higher Education*. SRHE & Open University Press, 116-132.

209. Willms, J. D. (1992/2002) *Monitoring School Performance: A Guide for Educators*. London and Philadelphia: RoutledgeFalmer.

210. Wilson, K. L., Lizzio, A. & Ramsden, P. (1997) The Development, Validation and Application of the Course Experience Questionnaire. *Studies in Higher Education*, 22 (1), 33-52.

211. Yan, L. & Kember, D. (2004) Avoider and Engager Approaches by Out-of-Class Groups: The Group Equivalent to Individual Learning Approaches. *Learning and Instruction*, 14, 27-49.

212. Yorke, M. (1994) Enhancement-led Higher Education? *Quality Assurance in Higher Education*, 2 (3), 6-12.

213. Yorke, M. (1995) Siamese Twins? Performance Indicators in the Service of Accountability and Enhancement. *Quality in Higher Education*, 1 (1), 13-30.

214. Yorke, M. (1996) *Indicators of Programme Quality: A Project Report Prepared for HEQC*. Higher Education Quality Council, England.

215. Yorke, M. (1998) Performance Indicators Relating to Student Development: Can They Be Trusted? *Quality in Higher Education*, 4 (1), 45-61.

216. Yorke, M. (2000) The Quality of the Student Experience: What Can Institutions Learn from Data Relating to Non-completion? *Quality in Higher Education*, 6 (1), 61-75.

217. Zhao, C. & Kuh, G. D. (2004) Adding Value: Learning Communities and Student Engagement. *Review in Higher Education*, 45 (2), 115-138.

218. Zimmerman, B. J. (2000) Attaining Self-Regulation: A Social Cognitive Perspective. In M. Boekaerts, P.R. Pintrich and M. Zeidner (eds.) *Handbook of Self-Regulation*, Academic Press, San Diego, CA, 13-39.