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Understanding Information Technology Skills Development in Undergraduate Accounting Programme: A Grounded Theory Study

By

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Thesis for the degree of Doctor of Philosophy
August 2007

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF LAW, ARTS AND SOCIAL SCIENCES
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UNDERSTANDING INFORMATION TECHNOLOGY SKILLS DEVELOPMENT IN UNDERGRADUATE ACCOUNTING PROGRAMME: A GROUNDED THEORY STUDY

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This research explores the process of IT skills development on an accounting degree course in a UK university using a grounded theory methodology. Data was collected using multiple qualitative approaches, including interviews, focus groups, observations and document reviews, focusing respondents in one traditional university in the UK and involving one big four accounting firm. For a more rigorous comparative analysis, data sources were extended to education and engineering programmes. However, the main focus was on the accounting programme, with information from the other programmes considered when relevant. Using grounded theory procedures (Strauss and Corbin, 1990, 1998), the research aims to generate substantive new theory on the phenomena, specifically on 'conception-driven IT skills development'.

The substantive theory proposes that IT skills development in teaching is driven by the perceptions of educators on issues primarily related to them (educators), institutional values, responsibilities for skills development, employers, support, learning, technology and students. It is suggested that educators with a 'positive private theories', particularly on educator-related issues, have demonstrated effort in IT skills development for students through integrating it into their teaching practice.

This research acknowledges basic IT skills development, including word processing skills, and familiarity with spreadsheets, presentation software, e-mail and the Internet (in the accounting programme investigated). A skill in using specific financial software, namely @Risk was also investigated. Many respondents, including educators and students, considered skills development insufficient and concentrated in just a few units. Some found skills related to accounting, tax and auditing software were lacking, suggesting a gap. The reasons for the gap emerged to be unclear expectations and lack of communication among stakeholders in accounting education. This is further explained by the nature of educators' 'private theory.'

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Acknowledgements

All praises and thanks are to Allah, the Most Gracious, and the Most Merciful.

I am grateful to many people for their great help during the whole research process.

First of all, I would like express my sincere thanks to my two supervisors, Dr Martin Broad and Professor Andrew Goddard, for their invaluable guidance and continuous support throughout the research. They have trained me to be independence, confidence and believe in myself.

I would like to extend my gratitude to the Faculty of Economics and Management, University Putra Malaysia (UPM) and the Ministry of Higher Education, Malaysia for the study leave and scholarship.

I am highly indebted to those people who contributed to my research in the field at the investigated university (UUI[1]), including alumni of accounting and finance degree programme for the year 2001-2005 and the big four accounting firm (PC[1]). Thanks are also due to the staff of the School of Management, University of Southampton for their support, and Dr Bruce Hunt and Mr Phil for being proofreaders.

I would also like to thanks all my fellow research colleagues. Special mention goes to Sajjad, Karina, Yang, Sophie, Maya, Mazwana, Wazman, Normah, Zach, Sham, Aniza and others for always being with me in my ups and downs. Special thanks to Gaspar for his valuable time and great help in understanding and discussing this research as well as to Larissa, Beauty and Yan Li for sharing their experience of being grounded theory researchers.

Thanks are also due to my friends at home, especially K. Ani, Azi, Aya and Azhar, K. Dah and Dr. Wan and at Southampton, Zu, Nani, K. Nik, Aunt Jameelah, Zainab, Skakila, Ustaz Fadhil and their families for their prayers and helping hands.

Special thanks to all my 'special friends' for their brotherhood. Special mention goes to A. Ismail and K. faridah for their 'magic words' which inspire me to undertake this research responsibility as well as to understand all aspects of life.

Furthermore, my appreciation to my brothers, sisters, in-laws and their families, Abang, A. Jak., Mek, A. Ri, K. Zam, Adik, Su, my in-laws, Bonda Hajjah Banun, A. Haji Ahmad, K. Rom, A. Sakor, K. Su, K. In, K. Mis, A. Sidek, A. Komo, Pipi, Tijah, Kamisah and all my nieces and nephews. Thanks for being patient, supportive and understanding and four years being apart have strengthened our love.

Last but not least, I would like to thank my husband, Mohd Taib and my princesses, Tasnim, Raihan, Kauthar and Jannah for their unconditional love, unfaltering patience, encouragement, sacrifice and understanding throughout this venture.

To my late parents, Senik and Gayah, thanks for their love, caring and nurturing. They have taught me the importance of knowledge.

To all including those whom are not mentioned here, the space is too limited to express my gratitude.

'May Allah reward all of you with enormous goodness'

جزاكم الله خيرا كثيرا

[1] For confidentiality, the pseudonym UUI and PC are used to refer to the investigated university and the big four accounting firm.

Definitions, abbreviations used

Definitions:

Information technology	:	"Hardware and software products, including networking and telecommunication, information system operations and management processes, and the human resource and skills required to apply those products and processes to the task of information preparation, production and dissemination and information system development, installation, implementation, operation, management and control."(IFAC 2003, p.7)

Abbreviations:

ADP	:	Accounting Degree Programme
AIED	:	Artificial Intelligence in Education
BAAEC	:	The Board of Accreditation of Accountancy Educational Courses
CAL	:	Computer Assisted Learning
CCT	:	Computers or IT as a computational tool
CLT	:	Centre of Learning and Teaching
HCI	:	Human-Computer Interaction
HEI	:	Higher Education Institution
ICT	:	Information and Communication technology
IFAC	:	International Federation of Accountants
ILT	:	Institute of Learning and Teaching
ISS	:	Information System Support
IT	:	Information Technology
NDPCAL	:	National Development Programme in Computer Assisted Learning
PC	:	Abbreviation representing name of the investigated big 4 accounting firm.
PCET	:	Post Compulsory Education and Training
PGCE	:	Post Graduates Certificate in Education
UGEC	:	Undergraduate Education Committee
UUI	:	Abbreviation representing the name of the university offering accounting and finance degree programme investigated
www	:	World Wide Web

Chapter 1

Introduction

1.1 Background to the research

Rapid advances in information technology (IT[2]) have extended to all facets of business and have significantly affected many professions including accounting (IFAC, 1995, 2003, 2006; Boritz, 1999; Jordan, 1999; Albrecht and Sack, 2000; Burns and Scapens, 2000; Alles *et al.*, 2000; Bierstaker *et al.*, 2001; Parker, 2001; Howieson, 2003; Robert Half International Inc., 2003; Kepczyk, 2005; Jones and Abraham, 2007). The implications are enhanced activity (less time preparing standardised reports and more time analysing and interpreting information) and new opportunities, such as in the area of business advisory and evaluative tasks. IT-related skills fall among the required skills necessary for success in the accounting profession (Gammie *et al.*, 1995; Howieson, 2003; IFAC, 2006). The dynamic nature of IT and its impact on the accounting profession demands that graduates are conversant with it alongside having technical accounting expertise and soft skills, such as communication and interpersonal skills.

Many academics and professional organisations seek the promotion of IT competent graduates and have voiced concerns over whether accounting education effectively and efficiently prepares graduates to meet these challenges (AAA, 1986; AECC, 1990; IFAC, 1995; Johns, 1995; Dearing, 1997; Lyons, 1997; Boritz, 1999; Stoner, 1999; Albrecht and Sack, 2000; Chang and Hwang, 2003; Howieson, 2003; IFAC, 2003; Lin *et al.* 2005). A common theme emerging from the literature is the need for greater development of higher level transferable skills including IT.

Many parties, including researchers, business leaders, professionals, educators as well as academic organisations have made rigorous initiatives and efforts to strengthen IT integration in accounting education. These include, but are not limited to Bhaskar (1982, 1983), Er *et al.* (1989), Collier *et al.* (1990), Crawford and Barr (1998) and Salleh (2000), who discuss alternative uses of computers in accounting education. Professional accounting bodies and academic organisations, such as

[2] The term IT or ICT is used interchangeably in this thesis. The term IT also includes the communication part as defined by IFAC, 2003, p.7.

BAA-SIG accounting education[3], BAAEC (1996)[4], Dearing (1997), IFAC (1995, 2003, 2006) and QAA (2000a, 2000b, 2000c), encourage and provide guidance to the integration of IT into accounting programmes. For example, Dearing (1997) recommends establishing a professional Institute of Learning and Teaching in Higher Education, among whose functions is a leading role in assisting institutions to exploit the potential of communications and information technology for learning and teaching innovations. Last but not least, some educators (these included, but are not limited to Marriot, 1992; Sangster, 1992, 1994, 1995a, 1995b; Marriott *et al.*, 1999; Sangster and Mulligan, 1997; Salleh, 2000; Larres and Radcliffe, 2000; Larres *et al.,* 2003, Broad *et al.*, 2004, Monk *et al.*, 2006) report on their actual experience in developing and integrating IT into their taught accounting units.

Despite these motivated and rigorous efforts, accounting education has been criticised for not developing graduates with the IT skills required by employers, and a growing gap exists between what accountants do or need and what accounting educators teach (AAA, 1986; Lyons, 1997; Heagy and McMickle, 1988; Larres and Oyelere, 1999; Albrecht and Sack, 2000; Ahmed, 2003; Chang and Hwang, 2003; Marriott *et al.* 2003; Lin *et al.*, 2005; Jones and Abraham, 2007). Lyons (1997) reports that stakeholders, such as accounting bodies, students and employers are dissatisfied with IT provision in university teaching and learning. Ahmed (2003) shows low levels of IT/IS skills/knowledge (competency) integration in the UK accounting degree programmes. It is suggested that the development of IT in the teaching and learning process will enable universities to produce students ready to enter the rapidly changing work environment (Lyons, 1997).

Issues emerging from the literature have motivated this research. The main issues are summarized as follows. Firstly, IT skills are important for accounting graduates in order to prepare them to face challenges of an IT-based working environment. Secondly, there is an expectation gap between educators and practitioners, in terms of skills as well as content development in accounting programmes. It is important to

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[3] Accounting Education Special Interest Group is established under British Accounting Association to undertake activities such as organising conferences, publishing proceedings in the overall aim of enhancing the educational base of accounting practice which includes greater awareness of IT development. [Online]. Available from : http://www.shef.ac.uk/~baa/sigs/accounting_education/accounting_education_sig.htm [Accessed 5 May 2005]

[4] BAAEC was abolished in 2001, but its contribution in encouraging the IT skills integration in curriculum through accreditation process is highly acknowledged.

understand the nature of the gap, and investigate the reasons for it; good efforts have been made to integrate IT skills in accounting education. Thirdly, it must be acknowledged what IT skills can feasibly be integrated and taught at university level, given the broad spectrum and rapid development of IT trends and possible constraints (Chang and Hwang, 2003). Fourthly, it is important to understand what are the effective ways to integrate IT skills, and implement the right ones to ensure the best return. Last but not least, the methodology underpins the existing research, which is dominantly informed by quantitative research (Marriott *et al.*, 2004). It is believed that qualitative methodology helps to discover issues and enrich understanding on the issues normally overlooked in quantitative studies.

1.2 Research objectives and research questions

The issues identified above have motivated this research, which attempts to understand the process of enhancing IT skills development in undergraduate accounting programme and involves the broad perspectives of three main stakeholders in accounting education, namely students, educators and practitioners. In order to achieve that, the following research questions are outlined as follows:

- What are the IT skills required for accountants from practitioners', educators' and students' perspectives?
- What are the factors influencing the integration of IT skills in the undergraduate accounting programmes?
- What are the IT skills developed in university accounting programmes and how are they developed?
- What are the issues facing the implementation of IT skills integration in accounting programmes?
- What are the critical success/failure factors in implementation?

1.3 Significance of the research

This research is significant for several reasons. Firstly, as introduced in the background section above, the emerging trends in IT have fundamentally altered the ways in which business is conducted, and in turn, have also dramatically influenced the accounting profession. IT has become an important skill for an individual to succeed in the profession.

Thus, it is significant to study the issue of accounting graduates' IT skills development in order to help them to enter into a challenging and modern accountancy career.

Secondly, issues of learning skills development, including IT skills for accounting graduates, have been on national and international education agendas for decades (for examples McKeown, 1976, in Salleh, 2000; AAA, 1986; AECC, 1990; IFAC, 1995; Dearing, 1997; IFAC, 2003, 2006; Helliar *et al.*, 2006). Several studies have reported dissatisfaction with accounting education programmes and their graduates, in spite of changes made (for examples Lyon, 1997, Albrecht and Sack, 2000; Ahmed, 2003; Howieson, 2003; Chang and Hwang, 2003; Lin *et al.*, 2005). Thus, this study is significant, since it aims to further explore the issues, enhance understanding on the process of skills development and gaining insights into the phenomena.

Thirdly, this study is significant in terms of the methodology used. Most research in the area is informed by the quantitative approach. They have verified that gaps exist between the expectations of accounting employers (practitioners) and accounting educators in some areas, including subject content as well as generic or transferable skills. Some studies have called for a qualitative approach in order to enhance understanding of the phenomena (Baker and Bettner, 1997; Kelly *et al.*, 1999; Marriott *et al.*, 1999, 2004). This study is significant, since it attempts to understand the issues from a different angle. Instead of testing hypotheses, this research focuses on generating theory from data that reflect practice, which can be relevant to policy-making.

1.4 Structure of the thesis

This thesis consists of ten chapters, including this introduction chapter as the opening chapter. The thesis then follows with three chapters of the literature review, a chapter of the methodology choices, three chapters of the analysis, a chapter of discussion of the findings and a chapter of the conclusion.

Chapter 1 introduces the background to the research. The issue of students not being equipped with the necessary skills is the foundation of this study, to explore and understand the process of IT skills development in the undergraduate accounting programme. This introductory chapter also outlines five main research questions in

order to achieve the research aim. This chapter then justifies the significant of this research, which includes the importance of research in the area of IT skills development and the potential contributions of the research by looking it from an interpretive, grounded theory approach.

The next three chapters, Chapter 2 to Chapter 4, review the existing literature with the primary purpose of informing general issues or substantive areas of focus. Chapter 2 reviews the existing guidelines on IT skills development to see what are the IT-related skills required by the profession and could be expected to be developed in accounting degree programmes. The Dearing committee report, subject benchmark statements, International Education Guideline 11 (IEG-11[5]), the reports of professional accounting bodies, and work of individual educators or researchers on IT-related skills development are reviewed. The literature suggests a general IT skills requirement, except for IEG 11, which provides a quite detailed list of IT-related skills, including IT control-related knowledge, IT knowledge requirements related to business systems, and IT-related skills required for users, managers, designers and evaluators of information systems. IEG 11 and others do not give a specific approach on how to develop the skills, but leave it to the accounting programme to flexibly develop them. The next part of the literature review covers ways to develop the skills and issues facing the development of them.

Chapter 3 further documents the possible ways of developing IT skills and issues in implementing them. A holistic integrated approach is suggested. The approach should consider the development of IT skills in the whole programme instead of in individual units. In other words, it is the collective work of all related parties instead of individual educators' work. Moreover, the skills and the way used to develop them should relate to subject knowledge development. However, in reality the holistic approach is not financially and operationally feasible and requires long-term commitment. Thus, partial and interim initiatives are encouraged, and meaningful integration is emphasised, in a sense related to accounting knowledge and close to accounting practice. This chapter focuses on the literature related to IT and accounting programmes only.

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[5] The guideline is recently being revised and renamed to IEPS 2.1 (IFAC,2006). The exposure draft is scheduled for approval in June 2007.

Chapter 4 further investigates the above issues, expanding the literature review to the development of other knowledge and skills in accounting and other educational programmes. It includes the development of subject content and other learning skills, such as communication. This chapter also reviews the teacher planning, thinking and decision-making literature, discovering the issue of teacher private theory.

Chapter 5 discusses research paradigms and the methodological stands underpinning this research. This study adopts an interpretive and grounded theory approach, to investigate a process phenomenon, IT skills development. The nature of the enquiry benefits from the grounded theory approach, which allows insights into the research area. Another reason is that the study does not aim to test any hypotheses, as much existing research did, but seeks to generate a theory derived from data that is able to explain the phenomena. Besides, it wants to see and understand the issues from a different angle from the existing quantitative perspectives. The chapter also briefly reports on the data collection and data analysis using sample analysis procedures and documents, where appropriate. The details of the analysis process and results are presented in the next three chapters, Chapter 6 to Chapter 8.

Chapter 6 documents the process and results of the first analytical procedures of grounded theory, open coding. This process aims to discover concepts and categories that represent phenomena and become the foundation for theory generation. From the 'macro analysis', starting with line-by-line analysis of the transcripts, followed with paragraph-by-paragraph and whole document reviews at the later stage, and 'comparative analysis', evaluating data from one respondent to another, twenty open categories were discovered. The chapter then theoretically describes the open categories in detail, and forming subcategories of the concepts that further explain the categories. The explanation also focuses on properties and dimensions to ensure the details of the issues are captured. The chapter describes the open categories on their own without detailing their relationships, since that is the focus of the axial and selective coding procedures which follows.

Chapter 7 then documents the process and results of the second analytical procedures of grounded theory, namely axial coding. This stage aims to uncover the links among the open categories and generate main categories, which are more abstract and have strong explanatory power of the phenomena.

Due to the interwoven nature of the three coding procedures, it is difficult to separately document the processes and outcomes. This thesis attempts to document them with the aim of giving a clear picture of the process and outcomes, while maintaining a complete understanding of them. Thus, Chapter 7 reviews the primary activities undertaken in the analysis, such as 'asking questions', 'comparative analysis' and the 'paradigm' approach to assist in seeing the linkages among the categories and discovering the main ones. While doing this, the core phenomenon emerges, as later verified in the selective coding. Therefore, for a complete understanding, the details of each of the main categories and their relationships are explained in Chapter 8.

Chapter 8 presents the final stage of the grounded theory analysis, selective coding. The main aim of this procedure is to identify the core phenomenon that explains the whole story of the research. In attaining that, the main categories are integrated and one way of doing it is by looking at them in terms of contextual structure and process. This helps to start uncover their implicit and hidden relationships. From this process, the main categories appeared to link to one phenomenon, termed conceptualising, which explains the process of IT skills development investigated in this research. In general, the chapter theoretically explains the emerging core phenomenon and the main categories surrounding it to complete the story of the research, which generates a substantive theory of conception-driven IT skills development.

Chapter 9 aims to locate this substantive theory within the extant literature. Initially, it compares the existing literature in the area of IT and other skills development in accounting programmes. Some similar findings are identified, including the specific IT skills developed in the current accounting programme, the nature of IT usage by students, which is mainly driven by coursework, individual-based initiatives instead of collective work and issues faced in the development process. This research adds to the literature in terms of additional IT skills developed, such as in financial-related software, @Risk and advanced use of Excel and Excel Solver. Other findings that can be added to the present literature are the highly interested and motivated educators and the need for a catalyst, as key success factors. The issues of educators' perceptions, which influence the development of IT skill development in teaching, are also among the key findings that can be added to the accounting education literature. These findings lead to further comparisons with the substantive theory of conception-driven IT skills development and the literature in the area of

teachers' thinking and decision-making. Similar findings on the areas in which educators tend to conceptualise and that influence their instructional decision-making concern educators, teaching, learning, students, and technology. Other areas of the literature concern areas on which preconceptions are made, institutional cultures, responsibilities as regards skills development, the syllabus, support and employers.

Chapter 10 concludes the thesis with a summary of the research and its key findings. The chapter highlights contributions of the research from theoretical, methodological and practical points of view. Theoretically, the research generates a substantive theory of conception-driven IT skills development. It explains the process of IT skills development in an accounting programme, driven by the preconceived ideas of educators about themselves, teaching, learning, technology, students, employers, support, institutional cultures and responsibilities for skills development. Methodologically, the thesis provides an example of grounded theory research, with detailed explanation of the process undertaken. It provides a different perspective on issues related to the phenomenon of IT skills development, normally studied using a positivistic approach. Instead of identifying the related issues on surface, the current approach provides in-depth understanding by seeking insights into the research area. Practically, this research contributes to policy making in teaching innovation and skills development, which should consider educators as main players. The training provided should guide educators to perceive matters in a way that guides them towards the required instructional design. The chapter proceeds with reflections on the grounded theory approach, which is practically complex to conduct and difficult to document. Suggestions for future research in the area close the chapter.

Chapter 2

IT skills guidelines

2.1 Introduction

The need for IT competency development in undergraduate accounting education is acknowledged in the literature by accounting educators and by practitioners, as mentioned in the background section of the previous chapter. What and how IT competencies should be developed in undergraduate studies are two important questions to be explored in order to ensure a successful implementation of embedding IT competencies in accounting graduates. This chapter reviews the literature on the first question about what IT skills should and could be developed in accounting programmes. It is impossible to cover every single area of IT skill, knowledge or competency, bearing in mind the constant flux of change. Therefore, a main foundation is to promote a life long learning. Thus, this chapter begins with this main aim of accounting education. Then, it proceeds with the IT skills, knowledge and competencies required as guided by educational organisations (Dearing, 1997; QAA, 2000a), professional bodies (IFAC, 2003) as well as individual educators (Ahmed, 2003; Goldsworthy, 1996).

2.2 The aim of higher accounting education

The aim of higher education systems, including accounting education is to sustain a learning community for life (AECC, 1990; Dearing, 1997; Kelly *et al.*, 1999). A 'holistic education' or 'holistic educational experience' produces graduates who have learned how to learn, and are capable of continuously adapting themselves to ongoing development and social change (Kelly *et al.*, 1999). In light of this, IFAC (2003) stresses the inculcation of skills and capabilities to solve practical problems through the application of theoretical knowledge and competencies as one of the prime objectives of professional education.

2.3 IT skills and knowledge for accounting graduates

As mentioned earlier, it is difficult to identify and embed all of the IT-related skills, knowledge and competencies required for accounting graduates into their undergraduate programme. However, there are some guidelines towards a framework for IT skills, knowledge and competencies that can be used in the process of incorporating the skills in accounting education. The remaining sections review this literature.

2.3.1 The Dearing committee report

Dearing (1997) identified a scope for the innovative use of new information and communication technologies (ICT) to improve the quality and flexibility of higher education and its management. Some of the Dearing (1997) recommendations regarding ICT are presented in Appendix A. They stress the increasing prospect of improving institutional efficacy. Realising the full potential has become a continuing challenge to management. One of the recommendations for institutions is to establish 'a professional Institute of Learning and Teaching' (ILT) to inspire innovation. The institute was established and transferred as part of Higher Education Academy since 2004. The Dearing (1997) also calls for senior management in higher education institutions to take an inspired lead in formulating a strategy for their institutions change and fully exploit the benefits of ICT. In addition, help from funding bodies and government are needed to encourage such a movement.

The use of communications and information technology is among the key skills and necessary outcome of all higher education programme (Dearing, 1997).

The next section reviews guidelines provided in benchmark statements.

2.3.2 Subject benchmark statements

The Quality Assurance Agency for Higher Education (QAA) has the responsibility for putting into effect the recommendations of the 1997 Dearing report. QAA has published subject benchmark statements for a range of disciplines, including accounting (QAA, 2000a). The subject benchmark statements (QAA, 2000a) emphasise both conceptual and applied aspects of accounting in meeting the minimum requirements of undergraduate degree programmes. Upon completion of a degree, students are expected to attain specific knowledge, abilities and skills related

to accounting, and in addition cognitive abilities and non-accounting specific skills (as tabulated in Appendix B).

The accounting profession as well as education must understand the current and future roles of IT in organisations. Accounting students are expected to have IT-related skills, such as the ability to use spreadsheets, word processing software and on-line databases in acquiring, analysing and communicating information.

Overall, the statements (QAA, 2000a, b, c) set threshold levels of attainment of knowledge, abilities and skills, as minimum standards of achievement consistent with the award of an honours degree in accounting by an institution of higher education within the UK. This means that students are required to have at least a basic knowledge and understanding in the topics, together with an understanding, which demonstrates some ability to make comparisons and critical evaluations. They are also expected to attain a minimal proficiency level, with cognitive ability to enable them to perform well in basic operations. As mentioned before, the threshold level is only a minimum requirement, but there is no restriction on institutions to set higher standards.

2.3.3 International Education Guideline 11 (IEG-11)

Dearing (1997) and QAA (2000a, b, c) cover the general area of IT in higher education. More detailed guidelines are in IEG-11, issued by the International Federation of Accountants through its Education Committee (IFAC, 1995, 1999, 2003, 2006). This review is based on IEG-11 as it has been referred throughout this research and IEPS 2.1 is still waiting for approval at a time this thesis is completed.

This organisation is considered to have a significant influence on the UK's accounting programmes as reflected in the full-type membership of the five UK major accounting professional bodies: The Chartered Institute of Management Accountants (CIMA), The Institute of Chartered Accountants in England and Wales (ICAEW), The Chartered Institute of Public Finance and Accountancy (CIPFA), The Association of Chartered Certified Accountants (ACCA), and The Institute of Chartered Accountants of Scotland (ICAS). At the time the Guideline was approved in December 2002, Mark Allison (Chair-UK) was one of the members of the sub-committee appointed to oversee the project and David Hunt from the UK was one of the members of the Education Committee. The direct involvement of UK representatives in the

preparation of the Guideline was considered to gear up IT skills integration in UK accounting education.

The IFAC took initiative to issue the International Education Guideline 11 (IEG-11) as a framework for integrating IT-related core knowledge, skills and competencies in pre- and post-professional accountants' education. IEG-11 was initially issued in 1995 and has been periodically updated. The first and second revisions were made in June 1998 and December 2002 respectively. As mentioned before, it was recently updated in 2006 and scheduled for approval as a new IEPS (the current equivalent to an IEG) at the June 2007 meeting.

The earlier editions (1995 and 1999) rely on an input-based, capability approach, which emphasises primarily the knowledge, skills and professional values required to demonstrate competence. In light of the profession's preferred approach of output-based, functional analysis, which mainly focuses on roles, tasks and sub-tasks carried out by professionals in the workplace, the 2002 edition adopts this approach in addition to the input-based one. That version lays out a revised set of capabilities (knowledge and skills specifications) as well as samples of tasks that a competent professional accountant should be able to perform in the workplace.

IEG-11 aimed to guide member bodies[6] in developing programmes to enhance the IT competencies of professional accountants and to prepare them to work in the IT environment. The IFAC guideline adopts the definition of IT as "hardware and software products, information system operations and management processes, and the human resource and skills required to apply those products and processes to the task of information production and information system development, operation, management and control" (IFAC, 2003, para. 22). Competency means the abilities to handle professional tasks conceptually and practically, according to the professional standards established by member bodies. Generally, conceptual knowledge is an understanding from a professional point of view of the implications of the concepts listed in the guideline. This knowledge becomes a foundation for practical skills development, which includes the ability to apply conceptual knowledge, analyse, synthesise and evaluate information (IFAC, 2003 paras. 43-45).

[6]IFAC comprises 156 member organisations in close to 120 countries (based on 2003 Annual Report) available from http://www.ifac.org/About/IFAC_Current_Annual.pdf [Accessed 7 Jan 2005]

IEG-11 first highlights the trends, challenges and opportunities derived from the rising importance of IT in the professional accountancy domain, industry and commerce, public practice and the public sector (IFAC 2003, paras. 26-31). It then addresses sets of broad prequalification specifications for IT knowledge and competency (IFAC 2003, paras. 63-114) under the categories of general IT knowledge requirements related to business systems, IT controls knowledge requirements, IT controls competency requirements, user role competency requirements and manager, designer and evaluator of information systems role competency requirements

The guideline also presents the detailed knowledge requirements in terms of main and sub topics to be covered (IFAC 2003, appendices 1 – 2a) and detailed competencies in the form of units and elements (IFAC 2003, appendices 2b-7). With awareness of rapidly changing nature of IT, the guideline also identifies post-qualification IT knowledge and competency requirements and stresses the need for continuing professional development (CPD) for accountants, to ensure that they maintain knowledge, competency standards and qualities after qualification.

The IFAC guideline is considered to be very detailed in guiding the integration of IT knowledge and competencies in accounting education. It is only a guidance and does not have any legal standing.

2.3.4 Reports by professional accounting bodies

Many reports based on surveys and interviews created by professional accounting bodies have identified the IT-related skills needed by practitioners. Table 2-1 summarises the IT-related activities and skills necessary for firms and individuals to succeed in three areas of public practice, based on surveys done by ICAEW (1996), as reported in Howieson (2003). Focus is given to exploiting technology to provide/interpret relevant timely financial information.

Auditing	Financial reporting	Tax advice and planning
Individuals: Excellent understanding of IT and the systems approach to auditing	Firms: Exploit technology to provide/interpret relevant timely financial information	Individuals: Ability to handle IT applications in order to access information quickly

Source: Adopted from ICAEW, 1996 in Howieson, 2003, pp. 81-82

Table 2-1 : IT activities and skills necessary for success in public practice

Howieson (2003) also presents a general summary of skills for future individual accountants, as summarised by ICAEW (1996) and Australian chief financial officers (ICAA, 1998). A summary is presented in Table 2-2.

ICAEW (1996)	ICAA (1998)
Strong IT skills	IT skills including systems usage (e.g. sophisticated modelling software), systems delivery (e.g. ensuring appropriate information flows)

Source: Adopted from ICAEW (1996) and ICAA (1998) in Howieson (2003, p. 86)

Table 2-2 : IT skills for future (individual) accountants

The tables show that practitioners view strong IT skills as a requirement for success in the accounting profession.

2.3.5 Individual research

Besides the guidelines by the educational organisations and professional bodies as reviewed above, there are some IT skills, knowledge and competencies highlighted by individual accounting educators or researchers. Some of the research is dated but still relevant and worth to mention as pioneers.

Goldsworthy (1996) believes in an increased knowledge level of spreadsheets, accounting packages, implementation and assessment of controls, software packages on personal computers such as word processing, graphics, databases and forecasting models. Spreadsheets, accounting packages and databases are also found to be the most three popular IT and IS topics, as viewed by educators in British University accounting departments should be taught in undergraduate accounting programmes (Crawford and Barr, 1997). Goldsworthy (1996) also sees a need for greater emphasis on security and controls in computer systems, for example, computer-assisted audit techniques, general audit software packages, fraud, privacy, cryptography, data protection, disaster recovery planning and related aspects, as well as for more in-depth knowledge of computing applications, such as management information systems and electronic data interchange, in-depth understanding of the potential and the dangers inherent in electronic commerce, information technology education for accountants, strategic planning, managing change, information and decision making, the nature of information and information and systems.

Ahmed (2003) studies levels of IT skills and knowledge already integrated or still required in accounting programmes, based on the five sets of IT/IS skills in IEG-11(IFAC, 1995). Based on surveys, he found that, in general, there is a low level of IT/IS skills/knowledge (competency) integration in accounting programmes in UK universities. The level of integration for the five sets of IT/IS skills/knowledge that is expected to be integrated in accounting programmes in UK universities is summarised in Table 2-3 below:

Competency	**Expected Level of integration**
General IT/IS	High
IT/IS skill/knowledge for accountant as a user of IT	High
IT/IS skill/knowledge for accountant as a manager of IS	Moderate
IT/IS skill/knowledge for accountant as a designer of IS	Moderate
IT/IS skill/knowledge for accountant as an evaluator of IS	Moderate to high

Table 2-3 : Level of IT integration in accounting programmes in the UK

Other IT skills that have been introduced to students are in expert system (Sangster, 1991, 1994, 1995a, 1995b, Sangster *et al.*, 1995) and Internet-based applications, such as www and e-mail (Sangster and Mulligan, 1997; Marriott *et al.*, 1999, 2003). The use of software packages on personal computers, such as word processors and the Internet can still be developed in accounting programmes. That is because, while computers are undoubtedly more common today than they used to be, it does not necessarily lead to increased skills in business uses of IT (Gazely and Pybus, 1997; Crawford and Barr, 1998; Stoner, 1999; 2005, Marriott *et al.,* 2003). Students are also found to overestimate their IT skills (Larres, *et al.*, 2003). Thus, we are not yet at the point where we can presume our future students are comfortable and familiar with all aspects of IT, in spite of the myths that 'our juniors' are all IT literate and highly skilled (Stoner, 1999).

However, Stoner's (1999, 2005) research shows the increasing IT skills possessed by students year by year, but provision of IT in accounting education should not be overlooked, since there is still a large number of accounting students who do not possess the relevant skills to help them reach their full potential. Thus, careful integration of IT skills in teaching should be considered for all.

2.4 Conclusion

Knowing and understanding the changing nature of IT and its tremendous capabilities, as well as the fixed time frame for accounting programmes, it is impossible to integrate all the required skills needed to develop competitive advantage. Accounting education, just like other education programmes, is founded on the aim to promote learning how to learn, to ensure lifelong learning. Basic but highly demanded IT skills at entry-level should be given priority integration. Some such as the use of word processing, spreadsheets, databases, the Internet and accounting packages are identified in the literature reviewed in this chapter. This review leads the research to further explore the I T skills required for accounting graduates and to what extent they are developed in current accounting programmes,

Identifying what IT skills, knowledge and competencies should be integrated in the accounting programme is not enough. Understanding and implementing the appropriate and effective way of incorporating them is also important to ensure the objective of integrating them is achieved. The next chapter reviews the literature on how they are or should be integrated in programmes.

Chapter 3

IT and Accounting Education

3.1 Introduction

The previous chapter reviewed IT competencies as recommended by educational organisations, professional organisations and individual academic researchers. Acknowledging the importance of an appropriate integration approach, this chapter reviews the methods adopted in the literature. It also reviews the issues and key failure/success factors of implementation.

3.2 Ways of embedding IT skills

Computers have been in use in tertiary education since the 1960s (Williams, 1991). In the UK, the first major use of computers in education was the National Development Programme for Computer Assisted Learning (NDPCAL) initiative, a computer assisted learning project (Hopper, 1977, in Williams, 1991). In accounting education, efforts were initiated by McKeown (1976, in Salleh, 2000). Since then, there has been a series of publications, discussing various ways to integrate computers in accounting education. Some computer science subjects were introduced to reflect the increasing role of IT in the practice of accountancy (Bhaskar,1982, 1983; Er and Ng, 1989; Collier *et al.*, 1990; Reynolds, 1991; Marriott, 1992; Sangster, 1992; Lyons, 1997; Crawford and Barr, 1998; Salleh, 2000).

However, having computer science taught independently on accountancy programmes was no longer a convincing approach, since accounting students are not expected to be an IT expert and to understand IT as a separate discipline, disconnected to accounting or organisation (Williams, 1991; Sangster, 1992; Crawford and Barr, 1998). Integrated courses rather than isolated computer science courses gave students an understanding of the principles of operation of hardware and software and their connection to organisational systems. This approach was recognised by professional accreditation bodies. For example, the Board of Accreditation of Accountancy Educational Courses (BAAEC) accredited the courses with no separate computing subjects (Sangster,1992).

Alternatively, educational technology, such as computer-assisted instruction (CAI)[7] was used in the syllabus so that students could work with spreadsheets and databases. The two dimensions of integration were then suggested, integrating IT skills and integrating IT as an educational support tool (Reynolds, 1991; Marriott, 1992; Sangster, 1992).

Integrating IT skills focuses on helping students to acquire the IT knowledge and skills relevant to understanding the role of IT in business (Reynolds, 1991). This dimension (for example, with the use of computers as computational tools) simulates the environment that students come across after their graduation (Sangster, 1992). Generic software such as word processors, spreadsheets, databases and computerised accounting system packages were used in hands-on experience as in the accounting industry (Lyons, 1997; Crawford and Barr, 1998; Salleh, 2000, Monk, 2006).

Integrating IT as an educational support tool focuses on using IT as a teaching/learning strategy to improve the learning experience and gain efficiencies in terms of supporting teaching staff (Reynolds, 1991). However, IT as an educational support tool (such as the use of Computer based instruction (CBI[8]) or (CAI)) is sometimes dismissed as part of integration, since it is more appropriate to refer to as 'use' of technology rather than integration (Crawford and Barr, 1998; Williams, 1991). Thus, the remaining review of the literature focuses on the first dimension, which is integrating IT skills, including using computers or IT as a computational tool (CCT) to prepare accounting students with appropriate skills for a working career after graduation.

3.3 Integration approach

Recognising the issue of how IT might be used in accounting education, the next point is to determine what are the approaches to be adopted in using IT to develop IT skills, whether through independent IT modules or integrated IT modules, and whether in individual units or whole course modules.

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[7] CAI is using computers to support conventional educator input or support it. (Sangster, 1992)

[8] CBI is instruction using computers without concurrent educator input.

3.3.1 The independent versus the integrated module approaches

Independent IT modules represent an approach where IT is taught on its own as an isolated subject. The modules can be taught by specialist or interested accounting department staff. As mentioned in the previous section, the approach is no longer appropriate. However, it is worthwhile to consider the good side and bad side of adopting it by referring to the advantages and disadvantages of the independent IT module approach, as discussed by Crawford and Barr (1998), outlined in Table 3-1.

Advantages	Disadvantages
Specialists do preparation and teaching. Thus, accountancy department staff can concentrate on subject matter and do not have to become proficient in teaching IT skills.	Students fail to grasp the necessity of acquiring IT/IS skills
More efficient approach since the materials are prepared for large numbers of students from different programme	Students do not see the relevance of the skills to accounting
Clear aim of the module	Students interest in computers will decline
Easily managed assessment, since it is directly related to module content on IT skills	

Table 3-1 : An independent IT module approach

Integrated modules represent an approach where IT skills are integrated as a part of a wide range of accounting modules throughout a degree programme. As suggested by Boritz (1999), the ideal approach is to develop IT knowledge and skills through incorporation into courses, such as accounting, auditing and tax education, which are not specifically identified as IT courses. This means that students are learning IT at the same time as they are learning accountancy-related skills. The rationale is that, in reality, end-users of accounting information systems need to have in-depth understanding of the processes involved in producing information from the systems. End-users also need to be aware of the issues related to the technology. They do not have to acquire thorough knowledge of the technology but need to be familiar with the skills of retrieving, manipulating and interpreting data. Thus, it is not essential for accounting programmes to have separate computer science or information systems courses as mentioned previously (Crawford and Barr, 1998). Furthermore, it is no

longer suitable to treat accounting information systems in isolation, since the majority of accounting systems are accounting information systems (Collier *et al.*,1990). This is also the direction of professional accountancy accreditation bodies (BAAEC, 1996).

The ideal way is to teach everything in an accounting programme from an information systems perspective, so that conscious integration is unnecessary (Williams 1991, Davies and Warman, 1995). This approach is supported by Goldsworthy (1996) and Boritz (1999). Goldsworthy (1996) suggests integrating the relevant theory of IT into traditional accounting units, such as describing the features of a general ledger package in financial accounting units and integrating relevant practical components of IT into traditional accounting units by assigning students to do master budgeting, using a spreadsheet package in a managerial accounting unit. Table 3-2 briefly outlines the advantages and disadvantages of an integrated module approach.

Advantages	**Disadvantages**
Students understand the importance and relevance of IT skills/knowledge/competencies to the accounting topics	Reduction of time spent on conceptual understanding of the main subject (learning IT skills)
Knowledge is acquired through contextualised examples and problems	Burden on students to learn two concepts (accounting and IT) at one time
Application of accounting principles using IT promotes productive thinking (learning based on understanding of principles) and retention of knowledge	Complexity in constructing exercises to meet dual purposes, increase IT skills and support the main objectives of subject matter
Reflection of real life can be regarded as the true definition of integration	

Table 3-2 : An integrated module approach

The disadvantage of reduction of time spent on a subject's theoretical framework is considered as a misconception by Sangster (1992) and should be removed in order to accelerate the implementation approach proposed by Williams (1991). He argues that, by definition, it is illogical and cites some studies that report the greater insights gained by students using computer applications.

3.3.2 The holistic versus the individual course approach

Another issue in integrating IT skills is whether the implementation is made at the individual course level or at the whole course module. The literature recognises that implementations are usually attempted at the individual course level. Meanwhile, it is recommended that a planned approach should be adopted to provide a cohesive curriculum with a holistic view of all modules in the programme (Crawford and Barr, 1997, Armitage and Boritz, 1986).

Gazely and Pybus (1997) also argue for teaching IT skills throughout a degree programme instead of only in the first or in a particular year for a few reasons. First, they argue that first year students particularly, only possess basic skills and lack work experience, cannot easily put their skills into context. Secondly, the level of skills accomplished through a one-semester course or an independent module is low compared to those demanded in real business. In particular, in-depth understanding is required to promote students with truly transferable skills. This in-depth understanding is gained from continuous problem solving activities rather than a relatively staged approach. Continual practice over a number of modules will reinforce learning and keep skills up to date (Crawford and Barr, 1997). Finally, Gazely and Pybus (1997) argue that students do not develop much on their own during university studies, yet undergraduate studies may be the only opportunity to learn good habits for working life. There is also evidence to suggest that computer integration in one specific course can only have a detrimental effect on students' attitudes towards using computers in general (Marriott, 1992).

Hence, a holistic approach to integration is recommended. However, it raises some issues of cooperation between module leaders that may not be easily resolved.

3.3.3 The ideal approach

The integrated holistic approach is recognised as the ideal way of embedding IT skills in accounting education. However, the approach is more suitable in long term learning, since it requires a substantial amount of time to redesign courses, train and recruit qualified instructors, and so forth (Boritz, 1999; Crawford and Barr, 1998). Thus, while moving towards achieving the ideal approach, an interim step should be taken by identifying specific IT-oriented courses that will meet most or all of the education requirements of IEG-11 (Boritz, 1999) and integration should be introduced in an optional form (Sangster, 1992) which can be achieved within the short term

(Crawford and Barr, 1998). This has already experienced by some (refer to Williams, 1991) and other integration efforts have been initiated by accounting educators in individual accounting units, as described in the literature reviewed in the following section.

3.4 Experience of IT skills integration

This section reviews the work done specifically to integrate IT in accounting education for the purpose of developing IT skills required beyond graduation. The following sub-sections compile papers reviewed under this category. The reviews do include those works that integrate IT as educational tools when it is clearly stated that their objective is to equip students with IT skills as required by the profession. This type of study will be further discussed. Other studies not belonging to any of the two categories but giving some contribution to awareness or effort to integrate IT skills in the accounting education are also reviewed as other IT-related research.

This review is also limited to work undertaken from the early 1990s onwards, which focuses integration within accounting units rather than as in isolated computer science units. The review also focuses on work done in UK University.

3.4.1 Actual experience of IT skills integration

Marriott (1992) outlines the rationale of using spreadsheets as a computational tool in teaching financial accounting and analyses their effectiveness, based on experiments on first year accounting students at Cardiff Business School. The findings revealed that there is no significant implication on students' test performance. However, the results also show that it is worthwhile to integrate, since it enhances students' IT skills, which allowing further integration in other courses, where educational benefits may be more readily obtained.

Sangster (1995a) states the undeniable need to include expert systems in the accounting curriculum, providing supporting with evidence from industry, the accounting profession and accounting education. Four papers relating to the benefits of expert systems for accounting students and possible ways of including them in the accounting curriculum are reviewed.

Sangster (1995b) shows alternative approaches to finding appropriate information on the Internet and how it can be used to help achieve the objective of teaching students

how to learn. It is believed that assigning students with a task involving an Internet information search will develop deductive skills, lateral thinking, adaptability and other attributes that will be useful in later life. Sangster suggests that educators should be proactive in seeking out the technology, learning about what it offers and experimenting with it, in order to assess how it should be used.

Sangster and Mulligan (1997) report on students' evaluations of the use of ICT (e-mail and Web) as instructional technology on an accounting systems course. By giving technology to the students made the course stimulating. The students were made aware of the potential of the information resources that the web offers. Furthermore, they were better prepared for the world outside university and better equipped to cope with a changing working environment.

Marriott (2004) describes the integration of computerised business simulation and spreadsheet models in an optional unit for accounting students, to help provide 'concrete experience', which is important to enhance students' learning processes, particularly for deep learning. The experiential learning approach, which involved active participation of learners, creates 'an enjoyable, challenging and rewarding learning experience' (p.56), which makes students understand real business processes as a whole, while enhancing their skill on computer spreadsheets. It was integrated through group work, where students were expected to exercise their existing spreadsheet modelling skills and 'algorithmic thinking', to prepare a model which may then be applied in a simulated real world environment.

Aisbitt and Sangster (2005) describe an experience of integrating Internet-based on-line assessment (OLA) in 'The Certificate in Accounting' course offered by The Open University, UK. The OLA is used to gain benefits for both faculty and students. Faculty benefits from time savings in test administration and evaluation. Students receive impromptu feedback, which helps them to evaluate their performance and take appropriate action on the parts that they do not do well. The paper also briefly discusses the problems facing the team relating to writing OLA questions and running the OLA. Most of the problems relate to technology infrastructure, including connection problems, server-related problems, access problems and software incompatibility. They also encounter problems related to the technical support that should be provided by the IT department of the institution as well as the software manufacturer. These problems create tensions for students and faculty, which amongst the implications are long working hours for the faculty. They create a need

for team commitment, reliable infrastructure as well as guaranteed support and investment. They stress that IT should be exposed 'in a meaningful and appropriately integrated manner' (p.385), rather than as an 'added extra' (p.384).

3.4.2 Other IT-related research

Marriott *et al.* (1999, 2002, 2003, 2004) report on students' use of ICT, the factors influencing its use and their perceptions on the potential for the Internet education. Data was gathered from students in two universities, one traditional university and one new university, using questionnaires and group interviews. The study found that students from both types of university were increasingly using the Internet and e-mail, while there were no changes in using other applications such as word processing, spreadsheets and statistical applications. The study also showed a decrease in the use of accounting ledger packages and CAL by students in the old type university over the duration of the study, as the old type university offered the packages in an early year of study, whereas to the new type university integrated the packages throughout the years of study. Students' use of mainstream accounting packages and CAL were dependent on the individual institution attended. The students developed a range of IT skills at university. However, the students from the old type institution particularly needed some training to refresh and familiarize them with IT applications that they occasionally used or left behind for some time. Another finding was the preference of students towards traditional methods of learning, particularly because of their value in offering social interaction. As a result, Internet-based learning should be employed when it supports the traditional approach to teaching and learning. This study differs from other studies in terms of methodology used. Most accounting education research is quantitative, whereas this study uses both quantitative and qualitative approaches. The latter approach is believed to produce more enlightening data.

Larres and Oyelere (1999) identified the extent to which newly-qualified members of the Institute of Chartered Accountants in Ireland believed that their tertiary education provided the IT skills necessary for a career in accountancy. The findings reveal that they believe that they possess IT skills as a result of their tertiary education, as required in the workplace. However, the findings are based on the perceptions of the respondents rather that their actual performance, which may include an element of over- or underestimation of their ability. The findings also imply an extension to tertiary accounting curricula to include new technologies in addition to the basic PC

skills like word processing and spreadsheets. This paper also suggests extending the research to include educators as another data source, so that the data can be compared and any difference in the relative perceptions of students and educators can be identified.

Larres *et al.* (2003) evaluated the validity of using self-assessment in measuring computer literacy among entry-level accounting students at Queen's University of Belfast and University of Warwick. A significant finding regarding computer literacy was that a huge majority of students over-estimated their computer knowledge.

The majority of quantitative studies use questionnaires as the main research instrument. While they can be used for example to detect variations between the elements under investigation, such as year of study, courses followed and university attended, such as in Marriott *et al.* (1999)'s study, they do not allow for an analysis of why such differences emerge. This issue can be tackled through qualitative studies using focus group interviews, which would enable such insights to be gained (Marriott *et al.,* 1999, 2003, 2004). Qualitative inquiry and focus groups form part of the present study's research methods. This thesis also extends the previous research, which mainly focuses on students as a data source and will include alumni, educators and practitioners.

3.5 Key success and failure factors

Several key success factors of the implementation of IT integration in accounting curricula are identified, including:

- identification of the right skills to develop (IFAC, 1995b; Lyons, 1998)
- high interest and commitment from the most senior policy makers (IFAC, 1995b; Lyons, 1997)
- clear communication of requirements (IFAC, 1995b; Aisbitt and Sangster, 2005)
- usage of commercial software (IFAC, 1995b; Aisbitt and Sangster, 2005)
- team commitment (IFAC, 1995b; Aisbitt and Sangster, 2005)
- strong evaluation and feedback instruments (IFAC, 1995b; Aisbitt and Sangster, 2005)
- adoption of integration across curriculum approaches (IFAC, 1995b)
- meaningful subject areas (Gazely and Pybus, 1997; Aisbitt and Sangster, 2005), interest and attitude of academics towards IT skills (Gazely and Pybus, 1997)

- the optimum benefits of IT (Sangster, 1992; Lyon, 1997).

There are also some key failure factors mentioned in the literature. For example, factors related to staff resistance to the innovation. Acceptance that integration is desirable and a willingness to experiment are two major staff sources of resistance related to IT integration (Sangster, 1992). Among the issues include conflicting demand on staff time, unacceptable learning methods to students, unwillingness to accept other than traditional teaching methods and so forth. Staff time is considered as a true constraint (Sangster, 1992). It is also argued that long-serving members of staff are unlikely to change their teaching approach of their own preference, and more recent members of staff who have come through the research route without any business experience may have limited knowledge of the practical aspects of accounting and IT. The attitude that IT skills are somehow not appropriate to any great extent in a degree course causes difficulties for educators who want to see graduates achieve a decent level of IT skill.

Another problem is related to resources. Although IT related modules are highly favoured by the accounting and finance students, they are not offered or offered only to a restricted number of students, because of limited resources both in terms of staff and infrastructure (Gazely and Pybus, 1997). Aisbitt and Sangster (2005) address the technology infrastructure problems such as software incompatibility, access problems and technical support as the main problems experienced in integrating Internet-based on-line assessment.

Besides those, some other factors contribute as key failure factors, such as an overcrowded accounting academic programmes and lack of institutional support (Long and MacGregor, 1996; Baker and White Jr., 1999; Allen, 2000), a number of extant educational issues and beliefs, such as change resistance, dominant use of scientific methods in accounting education, which trains rather than educates, and passive knowledge acquisition (Kelly *et al.*, 1999).

3.6 Conclusion

An appropriate integration approach is vital in the process of implementing IT skills within accounting education to ensure the objective to develop or enhance students' IT skills and prepare them for work a modern accounting environment, where IT skills are essential. Inappropriate integration will lead to a decline in students' interest

(Marriott, 1992; Crawford and Barr, 1998) or increase the number of incoming students who believe they possess IT skills, but in fact have little understanding of, or familiarity with the technology (Larres, *et al.*, 2003). Inappropriate integration might be worse than no integration at all (Sangster, 1992). The ideal approach is said to be the integration of IT skills in accounting units across the curriculum. However, because of lack of resources and the long term achievement required, the more practical approach is to start with those IT-oriented units in which most of the required IT skills can be incorporated. The next chapter reviews other related skills and content development in accounting education as well as other disciplines to have a broader understanding of the approaches and theories adopted in the development process.

Chapter 4

Skill development and teaching innovation

4.1 Introduction

The previous chapters covered the literature, specifically on IT-related skill development in accounting education. This chapter extends the literature review to other skills development, including subject-content in accounting programmes to broaden general background knowledge on the issue of skills development. The chapter also documents the reviews on teaching innovation, which is also considered relevant to the research.

4.2 Studies on other skills development

Developing generic skills in combination with subject specific knowledge provides added value to learning and teaching process (Broad *et al.*, 2004) and students' employability (Arquero *et al.*, 2004; Milner and Stoner, 2006). Many higher education institutions have recognized the importance of skills development as seen through the establishment of personal skills developments (PSD) modules (Morgan, 1997; Gammie *et al.*, 2002). The modules contain the personal skills, including team working, communications, time management, self-management, research skills, business procedures, leadership, performance appraisal and conflict revolution (Morgan, 1997). Gammie *et al.* (2002) add a few more skills, including those related to finding jobs, such as CV writing, interviews and job search skills. Other requirements are awareness of company culture and health and safety (Gammie *et al.*, 2002). The main question is what is best way to develop the skills in the accounting curriculum (Morgan, 1997; Albrecht and Sack, 2000; Gammie *et al.*, 2002). The opinions of students who are nearly completing their degrees or just coming back from work placements are significant input for the development process (Gammie et al, 2002). Research also found that using complex rather than simple case studies in small group teaching is helpful in developing skills (Arquero, 2004; Stoner and Milner, 2006).

Some research has focused on whether an expectation gap exists between the knowledge or skills acquired in university programmes and the knowledge that employers expect and prefer graduates to have (Zaid and Abraham, 1994; Francis

and Minchington, 1999; Morgan, 1997; Albrecht and Sack, 2000; Hassall, *et al.*, 2004; Arquero *et al.*, 2001; Zaid, O. and Martin, 2001; McCartney *et al.*, 2002; Miller and Woods, 2002; Chang and Hwang, 2003; Ahmed, 2003; Arquero *et al.*, 2004;). Some report on experience in embedding skills on accounting degree courses (Morgan, 1997; Arquero *et al.,* 2001; Milner and Stoner, 2006).

In terms of subject content knowledge, McCartney *et al.* (2002) examine the expectation gap in the area of internal auditing, Miller and Woods (2002) investigate gaps in knowledge of taxation and Francis and Minchington (1999) examine gaps in training quantitative methods of management accounting. Some studies focus on content coverage in accounting information systems courses (Heagy and McMickle, 1988; Theuri and Gunn, 1998). Generally, there is agreement on the relative importance of the topics covered. However, employers perceive inadequacy in several areas of the important knowledge (Francis and Minchington, 1999; Arquero *et al.*, 2001; McCartney *et al.*, 2002; Miller and Woods, 2002; Arquero *et al.*, 2004). Both employers and educators believe that it would be advantageous to equip graduates with skills beyond those required on a daily basis in their work (Francis and Minchington, 1999).

Interestingly, this research found that the employers perceived that graduates from traditional universities have stronger subject knowledge on taxation compared to those from new universities, but they prefer the type of taxation knowledge of new university graduates (Miller and Woods, 2002). Traditional universities cover a lot of subject knowledge but possibly not the most required by employers. A suggestion has been made that employers and academia need to collaborate closely to bridge the gaps in content as well as practical skill development (Theuri and Gunn, 1998; Chang and Hwang, 2003; Ahmed, 2003).

Morgan (1997) discusses important aspects of communication skills, such as the preparation of working documents, attentive listening skills and oral communication which are deficient in accounting programmes. Arquero *et al.* (2001) study the perceived importance of skills, including communication, team work, problem solving, pressure management, time management and IT for management accountants from the point of view of employers. Besides an indication of deficiency in some skills, employers also indicate that vocational skills should be developed in an integrated approach.

Stoner and Milner (2006) report on a project to embed the employability skills required for long life learning and a successful career in undergraduate accounting course, through small group teaching materials on two first year courses: management accounting and business statistics. Among the skills which are attempted to be developed are communication, self-awareness, interpersonal, inquiry, critical analysis, IT, numeracy, problem solving, creativity and organisational skills.

In their experience, some factors contribute to the complexity of skills development issues in educational programmes. One of the factors is students' dependency on 'instrumental and shallow learning strategies' (Stoner and Milner, 2006, p.3) acquired at school, but not suitable in dealing for the challenging environment of accountancy. Another factor is that they are unclear about the work domain, causing them to undervalue some of the content of the programme. Furthermore, the students show lack of confidence and inexperience in autonomous work, and do not recognise the importance of learning to learn for skills development and employability profile. However, later, the students start to acknowledge responsibility for their learning.

4.3 Studies on educational innovation

The literature review is extended to areas related to innovation in education, including success and failure factors (Hannan, 2005; Wopereis *et al.*, 2005; Whitworth, 2005), technological implications for teaching and learning (Ferdig, 2006; Hartley, 2007), theory in educational technology (Issroff and Scanion, 2002), as well as teacher's planning, thinking and decision making (Clark and Yinger, 1987; Wilson *et al.*, 1987; Borko and Shavelson, 1990; Schommer, 1990; Senge, 1990; Moallem, 1998; Howard *et al.*, 2000; Windschitl and Sahl, 2002; Yero, 2002, Churchill, 2006; Eley, 2006; Tondeur, *et al.*, 2006; Haydn and Barton, 2007).

The literature suggests that teaching innovation is much dependent on the educator. Yero (2002) states "The power to change education - for better or worse - is and always has been in the hands of teachers" (p.3). Research on teacher thinking has offered some propositions, including what and how teachers think strongly influence their act (Clark and Yinger, 1987; Borko and Shavelson, 1990; Senge, 1990; Moallem, 1998; Yero, 2002; Churchill, 2005; Tondeur *et al.*, 2006). Based on the literature on teacher thinking and teaching, Clark and Yinger (1987) identified four

major aspects of teacher's thought processes, which are the teacher's experiential world and frame of reference, the teacher's knowledge and beliefs, planning and interactive teaching and reflective thinking. Churchill (2006) summarises the literature as suggesting that "teachers hold cognitive constructs, beliefs, guiding principles, theories or preconceptions, which determine their instructional decisions and technology integration"(p.1). The teachers' private theories are developed based on previous and current personal experiences as well as organisational influences (Moallem, 1998; Churchill, 2006).

The literature also highlights several areas of 'teachers' private theory', mainly on students, teachers, learning and technology (Borko and Shavelson, 1990; Schommer, 1990; Moallem, 1998; Howard et al, 2000; Windschitl and Sahl, 2002; Churchill, 2005). There are other areas, including institutional influences (Borko and Shavelson, 1990; Yero, 2002), knowledge of curriculum and pedagogical content (Moallem, 1998), the nature of instructional tasks (subject matter), the teaching environment and the teaching process itself (Clark and Yinger, 1987; Borko and Shavelson, 1990), epistemology (Schommer, 1990; Howard et al, 2000) issues that impact on teaching practice. Churchill (2005) adds another two areas of teachers' private theory, which are design and change.

In terms of theory in educational technology, Issroff and Scanion (2002) conclude that there are two groups of theories related to using technology in teaching and learning. The first group of theories are from the field of Artificial Intelligence in Education (AIED) and Human-Computer Interaction (HCI), which underpin the effective design of teaching and learning materials. The second group is related to educational theories such as constructivism and activity based theory, which helps to understand the impact of technology on students' learning experience.

4.4 Conclusion

This chapter covered extant literature on other skills development in accounting programmes and teaching innovation. The literature shows the importance of developing skills beyond the ones required on a regular work basis to ensure long life learning. A common issue emerged is about ways of developing the skills, which influences teaching methods. The search for relevant literature was extended to innovation in education, including teacher planning, thinking and decision-making.

The reviews emphasise on role of teacher in making a successful teaching innovation.

This chapter ends the literature review part of the thesis. The next chapter discusses research methodology.

Chapter 5

Accounting research methodology

5.1 Introduction

Academic research is normally underpinned by some basic meta-theoretical and philosophical assumptions directly or indirectly defined by the researcher. Burrell and Morgan (1979, p.1) stress that "All social scientists approach their subject via explicit or implicit assumptions about the nature of social world and the way in which it may be investigated." It is crucial for social science researchers to ensure that underlying assumptions are considered in relation to their own personal values and beliefs regarding the nature of the social world (Hopper and Powell, 1985). This chapter presents the fundamental theoretical and philosophical assumptions behind the methodological approach of the present research. It begins with a review of the assumptions and the different sociological research paradigms. Then, it proceeds with the case of interpretive approach for the research in this thesis.

5.2 Sociology research paradigms (Burrell and Morgan, 1979)

There are four philosophical assumptions related to ontology, epistemology, human nature and methodology, described in the subjective-objective dimension, and sociologically in the regulation-radical change dimension. The relationships between these two dimensions described in the four paradigms of social theory, as presented in Figure 5-1.

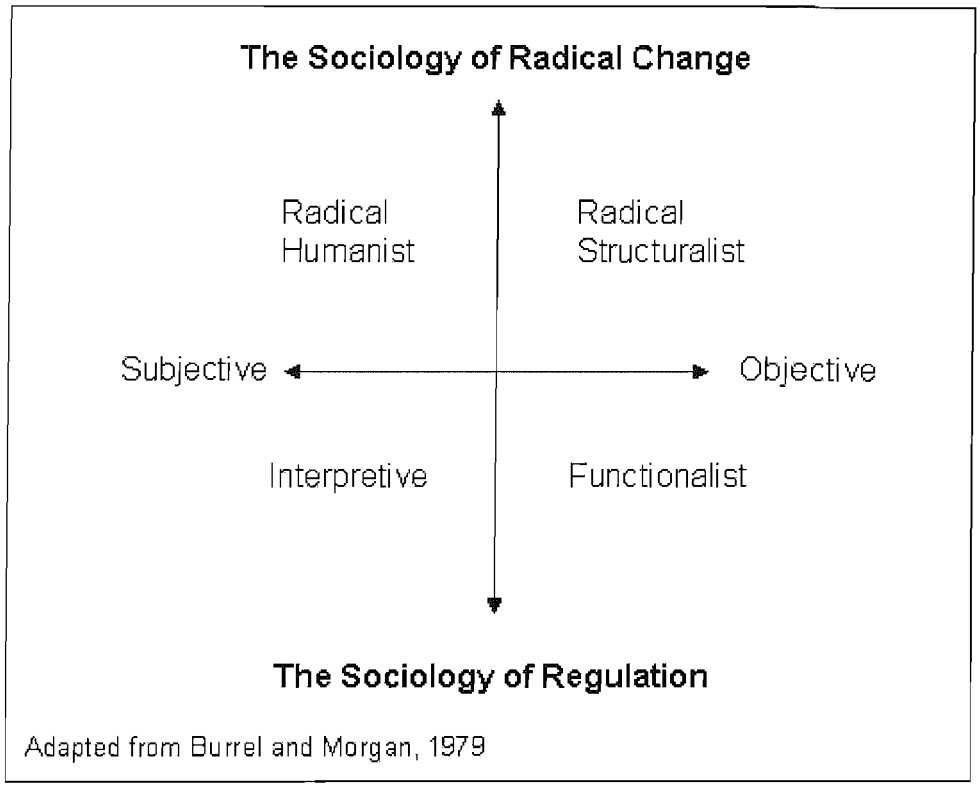


Figure 5-1 : Burrell and Morgan's sociological framework

The assumptions of the two dimensions are briefly explained in the following sections.

5.2.1 The assumptions of Social Science

The subjectivist and the objectivist are the two opposing approaches of social science. Ontology is concerned with the nature of 'reality', whether the reality is given "out there" or is a product of one's mind. Subjectivists, who are also known as nominalists, view the social world as the outcome of individual consciousness, whereas the objectivist approach is called realism, which emphasise that reality is external and exists independently of an individual's appreciation (Burrell and Morgan, 1979)

Epistemology debates the nature of knowledge. The debatable questions regard what forms it takes and how it can be acquired and passed on to other people. Subjective researchers tend to be phenomenologist, as they see knowledge of the world as being soft, subjective and intuitive, able to be obtained, through personal investigation and experience. In contrast, positivist researchers understand the social

world through explanation based on predicted regularities and causal relationships among components (Burrell and Morgan, 1979).

The human nature assumption emphasises the connection between human beings and their environment. In the subjective dimension, human beings are autonomous and free-willed, and act voluntarily in creating the world, whereas, objectivists view man and his activities as being determined by the environment (Burrell and Morgan, 1979).

Finally, the methodological issues relate to the approach taken in the process of conducting research. The first three assumptions debated above influenced the researcher as regards methodological choices. If the personal subjective quality in experiencing the world is stressed, an ideographic, methodological or qualitative approach, using observation or in-depth interviews, for example, is emphasised, as it allows insights into individuals' inner world and more focus on qualitative aspects. Alternatively, if the social world is assumed as a hard, external, objective reality, as in the natural sciences, then, the nomothetic methodological or quantitative study is applicable. It utilises standard research instruments, such as questionnaires and surveys to collect quantitative type data, which are then analysed using statistical techniques to identify, explain and predict relationships and regularities among social elements (Burrell and Morgan, 1979).

5.2.2 Social assumptions

The second principal dimension is the two distinctive views and interpretations of the nature of "society". One is regulation sociology, which concerns itself with maintaining the status quo, social order, consensus, social integration and cohesion, solidarity, need satisfaction and actuality bringing to unity. The other is radical change sociology, which focuses on structural conflict, modes of domination, contradiction, emancipation, deprivation, and potentiality leading to radical change (Burrell and Morgan, 1979).

The above two dimensions create four contiguous but mutually exclusive paradigms: the functionalist, the interpretive, the radical humanist, and the radical structuralist (see Figure 5-1). The paradigms are defined as "very basic meta-theoretical assumptions, which underwrite the frame of reference, mode of theorising and modus operandi of the social theorists who operate within them (Burrell and Morgan, 1979, p.23)." Their commonality in one of the two dimensions distinct from the other can be traced. For example, the interpretive and functionalist are both views that try

to explain the society as stable, in order and regulated. However, they see the world from different perspectives; the interpretive stresses the subjective aspect of the world, while the functionalist emphasises the objective features of it. The next section briefly describes the main accounting research paradigms.

5.3 Accounting research paradigms

Burrell and Morgan's (1979) construction of a general sociological research framework has become a foundation for many researchers, such as Morgan and Smircich (1980), Tomkins and Groves (1983, in Hopper and Powell, 1985), Hopper and Powell (1985), Chua (1986), Laughlin (1995) and Ryan (2002), who explored alternative methodological approaches from an accounting research perspective. In this thesis, the methodological approaches are reviewed under three accounting research paradigms; mainstream, interpretive and critical. The different stances on their ontological and epistemological beliefs as well as the relationship between theory and practice as discussed by Chua (1986) are compared in Table 5-1.

Mainstream	Interpretive	Critical
Beliefs About Knowledge		
Theory is separate from observations that may be used to verify or falsify a theory. Hypothetico-deductive account of scientific explanation accepted.	Scientific explanations of human intention sought. Their adequacy is assessed via the criteria of logical consistency, subjective interpretation, and agreement with actors' common-sense interpretation.	Criteria for judging theories are temporal and context-bound.
Beliefs About Physical and Social Reality		
Empirical reality is objective and external to the subject. Human beings are characterised as passive objects; not seen as makers of social reality. Single goal of utility-maximization assumed for individuals and firms. Means -end rationality assumed. Societies and organisations are essentially stable; "dysfunctional" conflict may be managed through the design of appropriate accounting control.	Social reality is emergent, subjectively created, and objectified through human interaction. All actions have meaning and intention that are retrospectively endowed and that are grounded in social and historical practices. Social order is assumed. Conflict is mediated through common schemes of social meanings.	Objects can only be understood through a study of their historical development and change within the totality of relations. Empirical reality is characterized by objective, real relations which are transformed and reproduced through subjective interpretation. Human intention, rationality, and agency are accepted, but this is critically analysed, given a belief in false consciousness and ideology. Fundamental conflict is endemic to society.
Relationship Between Theory and Practice		
Accounting specifies means, not ends. Acceptance of extant institutional structures.	Theory seeks only to explain action and to understand how social order is produced and reproduced.	Theory has a critical imperative: the identification and removal of domination and ideological practices.

Adapted from Chua, 1986

Table 5-1 : Main features of accounting research approaches

5.3.1 Mainstream accounting research

The mainstream school of thought, known as functionalism in Burrell and Morgan's (1979) framework (see Figure 5-1), comprises research approaches, such as objectivism, social systems theory, and pluralism, as described in Hopper and Powell (1985). Laughlin (1995) categorises the positivist, realist, instrumentalist and conventionalist approaches in the same group as functionalism. The details of each of the theories are not covered here, as the research in this thesis does not fit into any of them, as explained in the following sections. In general, all of the theories are

in the functional frame of preference, which treats individuals and organisations as external reality, constrained by the environment they inhabit. Thus, mainstream researchers adopt a scientific approach and emphasise quantitative methods. Concerning the society, some of them observe inequalities of power and structure, but those disagreements are reconcilable towards a unitary goal and stability of society. Their epistemological and ontological beliefs as well as views on relationship between theory and practice as discusses by Chua (1986) can be referred to in Table 5-1 in the previous page.

5.3.2 Interpretive accounting research

An interpretive methodology attempts to describe, understand and interpret the meanings that human actors apply to the symbols and structures within the settings in which they find themselves. Symbolic interactionism, grounded theory and ethnomethodology approaches are within this school of thought (Laughlin, 1995; Parker and Roffey, 1997). All of them have social subjectivity and disagreement with mainstream approach in common. Distinguished features of them to the mainstream as well as to the critical approaches are shown in Table 5-1. The current research is interpretive and uses grounded theory. Grounded theory is a qualitative research method with systematic procedures to "develop and inductively derive grounded theory about a phenomenon" (Strauss and Corbin, 1990, p.21). The rationale for this approach is presented in Sections 5.4 and 5.5. The processes for using them are described in Section 5.9 and the remainder of the research methodology chapter as well as in Chapter 6 to 8.

5.3.3 Critical accounting research

Critical or radical research comprises theories, such as Marxism, Structuration, German critical theory and French critical theory (Laughlin, 1995; Ryan *et al.*, 2002). In general, critical theorists regard populations as consisting of conflicting components and being subject to systems of power that lead to disparity and separation in all aspects of life. Their concern is to construct understanding of the social and economic world while criticising the status quo (Hopper and Powell, 1985). The radical structuralist and radical humanist strands (Figure 5-1) of Burrell and Morgan's (1979) framework are seen as dialectical aspects of the same reality. Hence, they are incorporated into a single philosophical framework straddling the subjective-objective dimension (Hopper and Powell, 1985; Chua, 1986; Ryan, 2002). Consequently, critical research can also be interpretive, but critical research adopts a

particular point of view regarding the research question, whereas interpretive research claims to take a 'neutral' stance (Baker and Bettner, 1997). The Table 5-1(Page 37)clearly distinguishes critical epistemological and ontological beliefs, as well as the relationship between theory and practice as defined by Chua (1986).

5.4 Choice of research methodology

This thesis attempts to understand the process of enhancing ICT in accounting education. It adopts the interpretive approach and grounded theory, fitting with the underlying ontological, epistemological and human nature assumptions. In other words, the assumptions underlying the functionalist and critical approaches are rejected. Reality is not seen as it exists out there as a concrete structure but as a product of human consciousness and appreciation. Knowledge in the social world is not perceived as hard, real or possible to acquire through explaining and predicting regularities and causal relationship between its components. It is soft and subjective, and can be understood through personal observations and experience. Glaser and Strauss (1967 in Parker and Roffey, 1997) argue for explanations of the social world grounded in observation and experience.

Humans are free-willed and possess internal logic that helps them 'experiencing the world' instead of 'behaving in the world' as for natural science's subjects. Thus, ideographic methodology is applicable, where inductive processes are emphasised rather than hypothetico-deductive processes as in nomothetic methodology. The inductive procedure observes the empirical world before the formation of explanations and theories about what has happened. More reliable theory can be developed through systematic empirical research (Gill and Johnson, 1997).

The similarities between the interpretive and critical approaches in terms of the subjective value of the social world are acknowledged. This study does not fit with the critical approach, in view of the differences between it and the interpretive stance. Interpretive research focuses more on how accounting is socially created and how the perceptions attached to it preserve the status quo rather than explaining which ideological pressure is influential and which group interest is met by regulation (Hopper and Powell, 1985). This research views the society as potentially in conflict, with inherent structures of power and domination, but reconciliated through common schemes of social meanings. On the other hand, the population is expected to change the current situation, while retaining some aspects of it, for a better future. Thus, this research posits itself in the low to medium level of change in Laughlin's

(1995) framework. A low level of change implies emphasis on preserving the status quo; a medium level of change position means readiness to change while preserving certain aspects of the current situation (Laughlin, 1995).

Baker and Bettner (1997) indicate that the main or primary disagreement between interpretive and critical research is the willingness of critical research to take a particular stance regarding the nature and purpose of the research and its political and societal implications, whereas interpretive research purports to take a 'neutral 'stance. Furthermore, grounded theory researchers enter the natural world of the participants as novices, having to discover not only concepts and relationships but also research question (Glaser and Strauss, 1967 in Parker and Roffey, 1997). On this basis, this research uses grounded theory in its attempt to study the process of enhancing information communication technology skills in accounting education by entering the research settings (which are a higher institution and a practicing firm) without any predefined theory, values or concepts. This is to allow the construction of research questions, which are relevant to the matter studied.

The above underlying assumptions are not the only arguments for the choice of an interpretive approach and grounded theory analysis. The choice reflects thoughts on pertinent issues raised in the literature review on research methodology in relation to the dominant mainstream (Tompkins and Groves, 1983, in Hopper and Powell, 1985; Chua, 1986; Baker and Bettner, 1997; Ryan *et al.*, 2002) calling for more interpretive and critical approaches (Morgan and Smircich, 1980; Chua, 1986; Hopper and Powell, 1985; Laughlin, 1995; Parker and Roffey, 1997, Ryan *et al.*, 2002; Baxter and Chua, 2003). The strengths of the mainstream approach are recognised but criticisms of it are also taken into consideration, which lead to an interpretive stance in this research. Some of the critiques are briefly presented below.

Tomkins and Groves (1983a, 1983b, in Parker and Roffey, 1997) refer to practitioners' claims of a mismatch between theory and practice with the use of scientific approach given the fact that very little research has been published in the interpretive and critical styles.

Chua (1986) comments that:

> *"Mainstream accounting ... with its emphasis on hypothetico-deductivism and technical control, possesses certain strengths but has restricted the range of problems studied and the use of research methods"* (Chua, 1986, p.601).

Baker and Bettner (1997) states:

> *"We argue that the type of research prevalent in the mainstream accounting journals, which is characterized by a positivist methodological perspective and an emphasis on quantitative methods, is incapable of addressing accounting complex ramification."* (Baker and Bettner, 1997, p.293)

Research in the social sciences has been identified as having predominantly been informed by the functionalist paradigm. However, since the 1970s, there has been a growing disaffection with this dominant paradigm (Willmott, 1993). Morgan and Smircich (1980) have explicitly stated growing concern that particular methods derived from the natural sciences have come to be seen as increasingly unsatisfactory as a basis for a social research.

The researcher concurs with the criticisms about using a scientific approach in social science studies and the extensive call for a more naturalistic approach is accepted. There are many different approaches to naturalistic or interpretive research (Denzin and Lincoln, 1994; Laughlin, 1995; Parker and Roffey, 1997; Creswell, 1998). Grounded theory is one of them. This research stands for interpretive and grounded theory approaches and their theoretical assumptions and research methods, which are capable of addressing limitations (Parker and Roffey, 1997). Glaser and Strauss (1967, p.3, in Parker and Roffey , 1997) argue that the grounded theory can produce frameworks that "fit and work" through development of data out of initial systematic methods; grounded theory is more likely to be a successful foundation for research and practice than theories logically deduced from a priori assumptions.

5.5 Grounded theory methodology overview

Grounded theory was originally introduced in the 1960s in the collaborative work of two American sociologists, Banney Glaser and Anselm Strauss (Glaser and Strauss, 1965, 1967, 1968 in Strauss and Corbin, 1998). The methodology is based on a discovery approach to the development of theory (Rennie, 1998, Locke, 2001). Theory is defined as "a set of well-developed concepts related through statements of

relationship(s), which together constitute an integrated framework that can be used to explain or predict phenomena" (Strauss and Corbin 1998, p.15). This methodology emphasises developing theory, grounded in data as viewed from the participants in the field of research. As a result, the generated theory is "likely to offer insight, enhance understanding, and provide a meaningful guide to action" (Strauss and Corbin, 1998, p.12). Furthermore, since it is drawn from data, it has a high tendency to reflect reality (Strauss and Corbin, 1998), and may "fit and work" (Glaser and Strauss, 1967, in Parker and Roffey, 1997) and filling the gap between theory and practice.

5.6 Approaches to grounded theory

With time, methodological developments have appeared in grounded theory. Strauss's approach deviated from the original grounded theory as a result of his experience in teaching, conducting and discussing research methodology issues. Later, Strauss collaborated with Juliet Corbin and produced works on a set of techniques and procedures as guidelines to novice researchers and supplementary to other texts on grounded theory (Strauss and Corbin, 1990, 1998). Their approach is primarily adopted to inform this study, mainly for the more objective and structured approach, which potentially reduces the degree of difficulties in operationalising the subjective and difficult nature of interpretative study (Parker and Roffey, 1997; Creswell, 1998).

Parker and Roffey (1997) illustrate some of the main divisions between Glaser and Strauss. Three major methodological differences are identified and briefly discussed as follows:

5.6.1 Research issues

They have a different approach to generating research issue(s). Glaser emphasises on entering the research site with no pre-conceived idea at all. However, issues are identified primarily according to the perceptions of the researcher, and the research, emerges in the course of the process (Parker and Roffey, 1997; Locke, 2001). Strauss and Corbin are more objective, allowing the researcher to determine the general issues for study before entering the research site (Parker and Roffey, 1997). Researchers are also allowed to use the literature and their background knowledge and experience to enable comparisons and insights (Strauss and Corbin, 1998).

Thus, a beginning researcher uses a pre-emptive strategy to focal research issues. This helps in investigating a broad research subject as in accounting education.

5.6.2 Analytical methods

Glaser favours on more flexible and general analytical procedures, with a rationale of allowing issues to emerge freely through constant comparison of incident to incident (Parker and Roffey, 1997). Strauss and Corbin also advocate the concept of emergent issues. They help researchers in the interpretation process by providing more structured and detailed techniques for data analysis (Parker and Roffey, 1997; Strauss and Corbin, 1998; Locke, 2001). A prescriptive procedure is practically helpful for novice researchers handling the substantive nature of qualitative data (Strauss and Corbin, 1998; Backman and Kyngas, 1999).

5.6.3 Verification

Glaser suggests leaving verification and testing of emerging theory to later researchers, through quantitative studies (Parker and Roffey, 1997). In contrast, Strauss and Corbin prefer continual testing wherever possible to verify the validity of concepts and relationships (Parker and Roffey, 1997). This study attempts verification throughout the research process, when necessary and practically feasible.

Some scholars acknowledge the disparity as variation in techniques (Parker and Roffey, 1997). The most important point is that the difference remains at a technical level, which fundamental elements as theory generating methodology is still maintained (Parker and Roffey, 1997; Strauss and Corbin, 1998). In this virtue, this study commits to the centrepiece of grounded theory methodology to discover a theory closely related to the context of the phenomena being studied (Strauss and Corbin, 1998; Creswell, 1998). In addition to that, the researcher appreciates the more detailed analysis tools in the approach of Strauss and Corbin (1998). The researcher has tried to innovatively and flexibly follow the procedures as they consider appropriate. They should not be rigidly followed and constraints the research process as the procedures are only developed "to provide some standardisation and rigor to the process" (Strauss and Corbin, 1998, p.13), but not to limit the creativity of the researcher.

5.7 Further rationale for grounded theory methodology

This study adopts the grounded theory tradition of qualitative enquiry for the following further reasons:

5.7.1 Subject of inquiry

This study aims to understand the process of embedding and enhancing Information Technology (IT) competencies within undergraduate accounting programmes. The centre of investigation is process phenomena: to study how individuals act and react, take action or engage in processes in response to phenomena. This nature of study is greatly benefited from grounded theory approach (Creswell, 1998).

5.7.2 Theoretical position

This study begins in an area of study and allows the theory to emerge from the data. It starts without a preconceived theory in mind. This is the main philosophy behind grounded theory studies, which are mainly intent on generating or discovering theory, an abstract analytical schema that explains particular phenomena (Strauss and Corbin, 1998; Creswell, 1998).

5.8 Research objectives

The research attempted to understand the process of enhancing IT skills integration in undergraduate accounting programme from a broad perspective of three main stakeholders, which are accounting educators, accounting students and accounting practitioner by using grounded theory methodology. The initial tentative research questions were:

- What are the IT skills required for accountants from practitioners', educators' and students' perspectives?
- What are the factors influencing the integration of IT skills in the undergraduate accounting programme?
- How are the IT skills developed in the undergraduate accounting programme?
- What are the issues facing the implementation of IT skills integration in accounting education?
- What are the critical success/failure factors in the implementation?

5.9 Research process

Traditionally, a research process follows the sequential activities of identifying phenomena, naming the research problem, collecting data, analyzing data, reporting results discussion and conclusions. This grounded theory study experienced an iterative and multi-tasking operation process in which the research activities of data collection, data analysis and formulation of grounded theory were performed interchangeably and repeatedly until the analysis process reached saturation. Creswell (1998) portrays data gathering in a grounded theory study as "a 'zigzag' process; out to the field to gather information, analyze the data, back to the field to gather more information, analyze the data, and so forth" (p.57). The data collection was finalized when the data analysis process reached its theoretical saturation; the point in category development at which no new information on categories[9] such as "properties[10], dimensions[11], or relationships emerge from the data" (Strauss and Corbin, 1998, p.143), and at which "the analysis has accounted for much of the possible variability" (Strauss and Corbin, 1998, p.158). Figure 5-2 diagrammatically illustrates the process undertaken in this grounded theory study, following Strauss and Corbin (1998).

[9] Concepts that stand for phenomena (Strauss and Corbin, 1998, p.101)
[10] Characteristics of a category, the delineation of which defines and gives its meaning
[11] The range along which general properties of a category vary, giving specification to a category and variation to the theory.

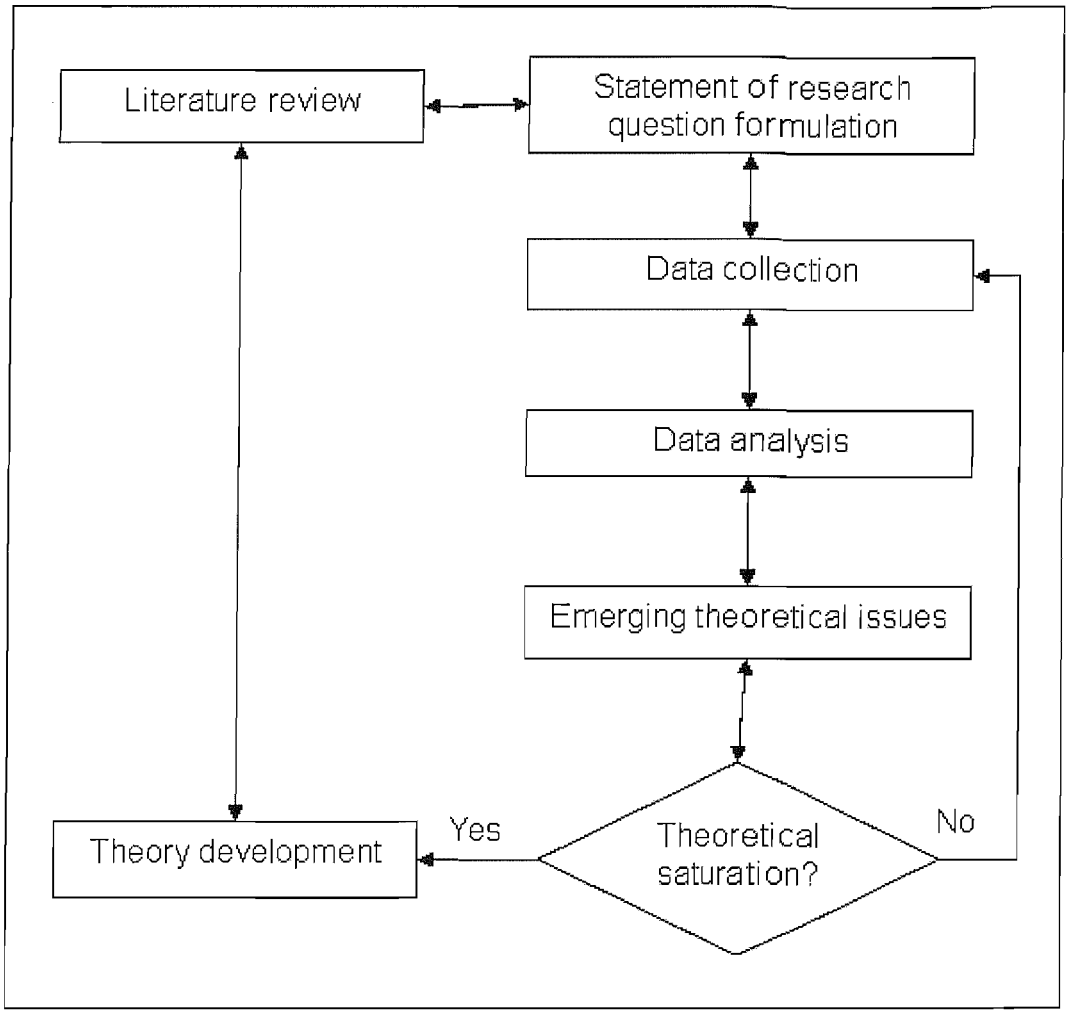


Figure 5-2 : An overview of research process

5.9.1 Research site

Consistent with the grounded theory approach of Strauss and Corbin (1998), an area to be studied is defined and an appropriate research site identified. The area is IT skills development in undergraduate accounting programmes and a UK higher institution (in the category of traditional civic university) is the site. This is mainly because of the deployment of a more positive integration policy for post-1992 (former Polytechnic) institutions or 'new' universities compared to traditional universities (Davies and Warman, 1995). Graduates from new universities have more exposure to IT and are expected to be better prepared to enter the modern-day workplace (Marriott *et al.*, 1999). On this basis, the accounting and finance degree programme offered by the School of Management of the particular university, abbreviated to UUI for confidentiality purposes was selected. The background of the university and the programme are briefly discussed in Section 5.9.2. Other factors were the possibility

of obtaining access to the research site as well as the close distance of the research site from the place where the researcher was based.

A few more schools were also selected later for additional data collection and comparison purposes. However, only the School of Education and the School of Engineering Science gave permission for access.

As regards practitioners, the researcher approached all the big four accounting firms because of their excellent establishment and perceived popularity as employers. However, only one of the big four accounting firms, abbreviated to PC for confidentiality purposes, agreed to give access to the researcher, limited to an interview session with a few members of staff, with no document reviews or observations allowed.

5.9.2 The background of the university and its programme

The UUI was granted a Royal Charter in 1952. Currently, the University has more than 20 academic schools which are organised into three faculties, Faculty of Engineering, Science and Mathematics, Faculty of Law, Arts and Social Sciences, and Faculty of Medicine, Health and Life Sciences. It employs 5,000 staff based across several campuses and has nearly 20,000 students. It is one of the top 10 research universities in the UK and has achieved consistently high scores for its teaching and learning activities.

The regulation for the programme (units studied) for 7 academic years starting from 1999 to 2005 is presented in Appendix C. The students will study eight units each year for three years. The tables in Appendix C show that, there are no changes on the regulations for the academic years of 1999/2000 to 2001/2002.

Some changes made in 2002/2003. First, 2 units of quantitative methods offered in the first years were replaced by 'Management Analysis' and 'Information Systems & Information Technology' units. Second, 'Law for Accountants' and 'Applied Microeconomics 2' units offered in the second year units were replaced with 'Commercial Law' and 'Financial Management Unit'. Third, 'Organisation & Management' and 'Company Law' units were introduced in the second year to replace two optional units. Fourth, in the second year also, the name for 'Management Information II' was changed to 'Management Accounting'. The recommended text was different even though the course contents were still maintained. 'Management Research' unit was introduced to replace 'International

Banking', which became one of the optional units offered in third year. Fifth, 'Advanced Management Accounting' was changed from optional to core unit. Sixth, Starting from 2002/2003 academic year also, students were require to choose more units from Accounting and Management units compare to other units such Economics, Languages and other social sciences units.

Starting from 2003/2004 academic years, all codes for units offered by School of Management were changed to MANG instead of AM while the contents were the same. 'Corporate Governance' unit was added to the option list. The rest of the units remain the same, including the contents. Overall, there were not many changes in terms of the unit contents and the units were taught by the same people through out the seven academic years.

Applicants for the programme are required to have grades AAB from three subjects at A level. It also welcomes candidates from a wide range of foundation programmes and other qualifications such as European, International or Welsh Baccalaureate and expected to attain an equivalent standard to the A level applicant.

Table 5-2 shows number of students enrolled and graduated under the programme from year 2001 to 2006.

	2001	**2002**	**2003**	**2004**	**2005**	**2006**
Enrolled	37	48	74	48	51	71
Graduated			39	44	69	42

Table 5-2 : Number of students

The School of Management was graded as 'excellent' in the assessment of its teaching quality in October 2000 by the national Quality Assurance Agency. The programme is accredited by the accountancy professions and the units exempted from year 2000 to 2007 are shown in Appendix D.

The latest survey of School of Management graduates showed that 87% were employed or undertaking further study six months after graduating[12]. Many of UUI's graduates go on to professional training and graduate management schemes while

[12] Figure based on returns from the 2005 Destinations of Leavers from Higher Education survey conducted by the Higher Education Statistics Agency.

others begin careers in management, accounting, finance or banking. A small number of students may form their own businesses on graduation, or within a few years of graduation. Recent recruiters of School of Management students include a range of large and small organisations in both the public and private sector, including BAE Systems, Barclays, BDO Stoy Hayward, BT, Deloitte, Ernst & Young, Grant Thornton, HSBC, KPMG, Orange, PricewaterhouseCoopers and Sainsbury's.

Table 5-3 shows accounting-related units and the IT/ICT skills integration in the unit.

Unit	IT/ICT
Financial Accounting 1	EQL (computer tuition package) is provided at university and residence hall's workstation as optional reference.
Financial Accounting 2	None
Financial Accounting 3	Use of PowerPoint for group presentation
Management Information (MA1)	Computer-based assessment is conducted since 2002.
	Since 2002, Students were using Excel in IT-based lab for an hour per week for three weeks. In the first week, students revised on basic function of Excel such as formatting, using formula through preparation of cash budget. In the second and third week, students were exposed to macro function, plotting graph and use of IRR and NPV functions through investment appraisal assignment.
Management Accounting 2	Use of PowerPoint for group presentation
Management Accounting 3	Since 2002, students were using Excel and Excel Solver in IT lab to work through simplex linear programming exercises and @Risk software to run simulation that model uncertainty of NPV method in investment appraisal topics.
Tax policy	Use of Internet for information searching
Auditing	None
Corporate Governance	None

Table 5-3 : IT Skills Integration in Accounting-related units

5.10 Data collection process and method

Data collection was progressively conducted from May 2004 to July 2006. The first stage of data collection began with the identification of respondents through 'judgemental sampling', which allows researchers to use their own judgement in

selecting data sources to help them gain good understanding on a particular phenomenon under investigation (Patton, 2002). As the emerging concepts and issues were evolving, the data collection process was carried out using 'theoretical sampling' techniques, which led the researcher to focus and gather information on the evolving issues and make theoretical comparisons and discover the evolving theory (Strauss and Corbin, 1998). The theoretical sampling technique led to the extension of data from accounting educators to non-accounting educators involved in teaching the programme, as well as other officers involved in undergraduate teaching. Data sources were also extended from present students to alumni of the accounting and finance degree programme of the UUI. For a more general understanding and comparison, a few attempts were made to gather further data from other schools within the UUI. The School of Education and the School of Engineering Science finally gave permission to the researcher to access further data from their schools. The respondents were approached through a formal letter to their heads of school, human resource personnel and key personnel introduced to the researcher. A sample access letter is provided in Appendix E. The formal approach to obtain access to data was normally either preceded with or followed by informal communication. The work received the approval of the relevant ethics committee as shown in Appendix F. Data has been gathered, analysed and destroyed according to some agreed protocol.

The primary data collection methods were focus groups, personal interviews, document reviews and observations. Table 5-4 summarises the data collected throughout the study.

Document Reviewed	Focus Group	Interviews	Observations
Undergraduate Student Handbook I	3 focus groups (one group for each year)	18 academic staff	Lectures
Undergraduate Student Handbook II	6 focus group sessions	3 support staff	Class-room based tutorials
Course outline for Accounting and Finance Degree Programme and some programme offered by School of Education and School of Engineering Science	3-5 attendances per session	5 professionals	IT-based lab tutorial
Minutes of meetings of the Undergraduate Education Committee (UGEC)	20 students in total	7 alumni	Meeting of UGEC

Job application forms	7 Informal Interviews	Total number of formal interviews = 33	

Table 5-4 : Summary of Data Collection

5.10.1 Focus group

Focus groups were held to gather data from students studying on accounting and finance degree programmes. A few methods were engaged to approach the students. First, the researcher asked for volunteers through announcements in classes when term started. Unfortunately, few students were willing to be volunteers, which led researcher to undertake a second approach. In that approach, some students were identified and contacted by electronic mail. In both approaches, only general information was disseminated to avoid biased about IT knowledge and interests. Thus, selection bias is acknowledged and tried to be avoided. Finally, after some correspondence with students, six to ten students in each study year were sent a formal letter requesting them to attend focus group sessions at a particular date and time. Three separate focus groups were formed to represent each year of study. Two focus group sessions lasting on average one hour, were conducted for each group, with three to five students per session. The first session was conducted in October 2004, with another in April 2005 for the purpose of validating the data from the first session and to seeking further information.

The preparation for the focus group and the techniques used during the session were guided by McNamara (1999) and Kruger (1998a, 1998b, 1998c, 2000). Every session began with a welcoming speech and introduction, as well as ground rules for the session, as presented in Appendix G. Primarily, they were informed of the way that the session would be conducted; the researcher played a role as moderator, promoting issues to be discussed, and the discussions were totally dependent on the active involvement of all participants. The researcher bias is acknowledged thus the researcher tried to avoid that by encouraging the participants to discuss the issues among them rather than directing their answer to researcher. The questions were also general and open-ended type of questions as provided in Appendix H. The participants were considered as less influencing by researcher since most of them did not have contact with researcher before. They were also actively discussed among themselves and willingly shared their negative and positive opinions as well as their good and bad experiences. For examples, they expressed their dissatisfaction on some issues such as the perceived irrelevant content coverage of

IT and IS unit learned in year 1 and the lack of IT skills development in the programme. They also expressed their appreciation and pleasure on some IT skills development initiatives.In general, all the participants from year 1 and year 3 were actively involved in the discussion. Only two out of four of year 2's group showed some interest in the discussion. The other two showed less interest, yet still shared their opinions and experiences when they were asked to. The reluctant to participate is considered as relevant data. It showed that reluctant to participate is due to their lack of interest and knowledge on the issues. The two respondents expressed their fear of the term 'IT' and their clueless idea on IT skills expectation for the career of accountancy.

Participants were also informed that the session was to be tape-recorded for transcription and analysis purposes and they were assured of confidentiality. Semi-structured questions were planned prior to the sessions, complemented with probing questions as issues of significance emerged. The set of semi-structured questions used in the focus group session is given in Appendix H. Besides that, some forms were prepared to assist in note-taking activities during the focus group sessions, covering the flow of communication among the participants, the way they responded and their understanding of the questions. The sample forms are presented in Appendix I. The forms were also used during reflection immediately after the session, to identify emerging concepts and issues, which later helped the researcher to expand the questions and conduct the follow-up focus group sessions. The sessions were then transcribed before the next round of focus groups.

A colleague attended two of the early sessions and acted as record keeper, note-taker and observer. The colleague also helped in the discussion of identifying emerging issues as well as giving comments regarding improvements to the following sessions. The participants were informed the presence of the observer and made aware of his roles, to avoid bias throughout. All six focus group sessions were transcribed and each of the participants was given a copy of the transcripts for validation. They were also contacted through electronic mail and telephone calls for any clarification needed throughout the process.

5.10.2 Interviews

A total of forty interviews including seven informal interviews were conducted with thirty nine respondents. Eighteen of them were academic staff, fifteen involved in teaching in the accounting and finance degree programme in School of Management,

two from School of Education and one from School of Engineering Science. Only one person was interviewed from School of Engineering Science, as that person was chosen during the school meeting to represent the school for the interview. He was the best representative of the school due to his position as coordinator of the programme and his involvement in the programme involving the school and the accounting firm, PC.

The other respondents were three support staff, one of whom was a teaching and learning coordinator for School of Management, one an educational technologist from the Centre of Learning and Teaching (CLT) and one from Information System Support (ISS). The remaining twelve respondents were practitioners, five of whom working with PC and two involved in graduate recruitment. The remaining seven respondents were alumni of the accounting and finance degree programme from UUI, who had graduated in years 2001 to 2005. The alumni were working in a wide range of companies ranging from local government agencies, small to medium private firms to big four companies, which automatically offset the small number of respondents interviewed in PC and helped to understand the phenomena from the perspective of a wide range of employers. Seven informal interviews were made with six students to further clarify some issues in a less formal way, which helped the researcher to gain a better understanding of the phenomena. Respondents in casual conversation actively shared their experience and opinions in depth on certain issues.

Reflection was made immediately after each interview to identify emerging issues, which helped the researcher to plan and conduct the following interviews. The first few interviews were fully transcribed and used as a template for note-taking during the following interviews and later reflection, as well as during comparative analysis, to identify any similarities, differences and additional information. The other interviews were also fully transcribed, particularly when they raised additional or different issues. A decision not to transcribe a session was made if the researcher found that there was no additional or relevant information from the interviews. This occurred sooner with non-accounting subject educators and support staff. A total of twenty two formal interviews were fully transcribed, thirteen of which were interviews with academic staff including all three from School of Education and School of Engineering Science, nine interviews with practitioners comprised four from PC firm and the remaining five from the alumni group. Although the remaining interviews were not fully transcribed, any significant information was noted. The interviews were

compared with other interviews using the template derived from the fully transcribed session, through listening to the tapes, which helped to identify additional issues.

The interviews were based on a set of pre-planned open questions, modified slightly, depending on the session. For example, a few related questions were added relating to the post held by the interviewee. Appendix J shows a sample of the basic questions.

5.10.3 Document review

Document reviews were valuable sources of understanding or background knowledge, prior to the focus group sessions as well as interviews. They also helped the researcher to compare, validate and supplement some of the data gathered through other methods. In the time span, some documents were reviewed, including educator profiles, student handbooks, minutes of the Undergraduate Education Committee (UGEC) meetings, all course outlines (for the accounting and finance degree programme, the programme offered by the School of Education, including foundation degrees, the Certificate of Education in Post Compulsory Education and Training (PCET), and the Post Graduates Certificate in Education (PGCE)) and the job application forms of the various organisations, include the big four firms.

5.10.4 Observation

A number of observations were conducted to enrich the data collected in other methods. In some of the observations, the researcher took an approach of observer-as-participant, for example in the case where the researcher was conducting classes. Observations were made both in the sessions conducted in regular classes and IT based lab environments. A complete observer approach was employed in the cases where the researcher was observing classes conducted by others and in the cases of attending formal meetings of UGEC. Informal observations were frequently made during casual conversation with respondents on occasions such as regular coffee time on Friday and any informal meeting.

5.11 Data analysis

When the data had been recorded and transcribed, three stages of analysis, open, axial and selective coding were performed as guided by Strauss and Corbin (1990, 1998). In practical data collection, coding and analysis were interchangeably and

simultaneously carried throughout the research process. The three stages of coding were conducted in parallel, as it was difficult to distinguish which stage the researcher was in, especially at the open and axial coding stages, owing to the close and iterative nature of grounded theory methodology. The analysis processes aimed to discover a substantive grounded theory of IT integration in this particular higher educational institution. The coding processes systematically and rigorously led to the construction of theory.

The researcher found that some steps in the analytical process were difficult to identify and needed attention. It is therefore difficult to document them clearly at some points (Strauss and Corbin, 1990, 1998). Procedures are, however, briefly described wherever possible in grounded theory terminology and a comprehensive list of terms (Strauss and Corbin, 1990, 1998) used is provided in Appendix K.

5.11.1 Open Coding

At the open coding stage, the process aims to generate categories based on their properties and dimensions. Categories are 'concepts that stand for phenomena' (Strauss and Corbin, 1998, p.101), while 'properties are the general or specific characteristics or attributes of a category, dimensions represent the location of a property along a continuum or range' (Strauss and Corbin, 1998, p.117). The steps involved include conceptualizing, discovering, naming and categorizing the phenomena according to their properties and dimensions.

In practice, conceptualising was made through a line-by-line analysis of the transcripts, breaking down the data and identifying any significant ideas, concepts, events, objects and so on. The naming process was performed using labels for any terms relevant to the context (open concepts). The researcher tried to use the terms originating from the data (vivo-code) wherever possible to preserve the contextual meaning of the concepts. Otherwise, relevant terms perceived to represent the embodied meaning of the data were used.

The concepts were constantly compared in terms of their attributes and dimensions, then classified according to shared attributes and grouped into open categories, answering the question 'what is going on here?'. Asking questions and theoretical comparison are two basic analytical tools used to stimulate thinking about the properties and dimensions of categories. However, in practice, not every single concept was clearly identified in terms of its property and dimension, which sometimes limited the critical and creative thinking of researcher. In such cases,

explanation of the concepts in terms of specific properties and dimensions was avoided, and focus was given to different ways of explanation to ensure detailed and deep understanding of that particular concept. Figure 5-3 demonstrates how open concepts were categorized into categories depending on their properties and dimensions.

<table>
<tr><th>Concept</th><th>Property</th><th>Dimension</th><th>Category</th><th>Sub-Cat</th></tr>
<tr><td rowspan="5">• Support
• Access S
• CLT S
• Colleague S
• Employer
• ISS</td><td rowspan="3">Availability</td><td>Available</td><td>Motivating factor</td><td rowspan="5">• What?
• When?
• Where?
• How?
• Who?</td></tr>
<tr><td rowspan="2">Not available</td><td>Barrier</td></tr>
<tr><td>Future improvement</td></tr>
<tr><td rowspan="3">Accessibility</td><td>Easy</td><td>Motivating factor</td></tr>
<tr><td rowspan="2">Difficult</td><td>Barrier</td></tr>
<tr><td>Future improvement</td></tr>
</table>

Figure 5-3 : Sample of classifying open-concept to open category

As an example, the concept of support can be categorised as a motivating factor, a barrier or a future improvement category, depending on its position within the dimensional range of availability and accessibility attributes. In terms of availability, if the support (physical or technical) is available, it becomes a motivating factor; otherwise it becomes a barrier or something to be improved in future. The same assessment is given to the accessibility of the support; if the support is easy to access, it is a motivating factor. On the other hand, if it is difficult to access, it can be categorized as a barrier or future development category. The open category is then further clarified in terms of subcategory, which helps to answer questions such as what, who, when, where and so on.

Besides the regular notebook, a word processor, spreadsheets, Computer Assisted Qualitative Data Analysis Software (CAQDAS), Nvivo version 2.0, were used throughout the open coding process. The software became useful in managing the labelling and the categorizing process, keeping the researcher close to the data. The software also provided an environment in which the researcher was able to go back and forth to data and trace them easily and quickly. Furthermore, any analytical

thoughts could be recorded systematically and kept close to the data. It acted as a program manager and workstation for the researcher. Figure 5-4 and Figure 5-5 show samples of the outputs of Nvivo listing open concepts and open categories developed at one stage of the process.

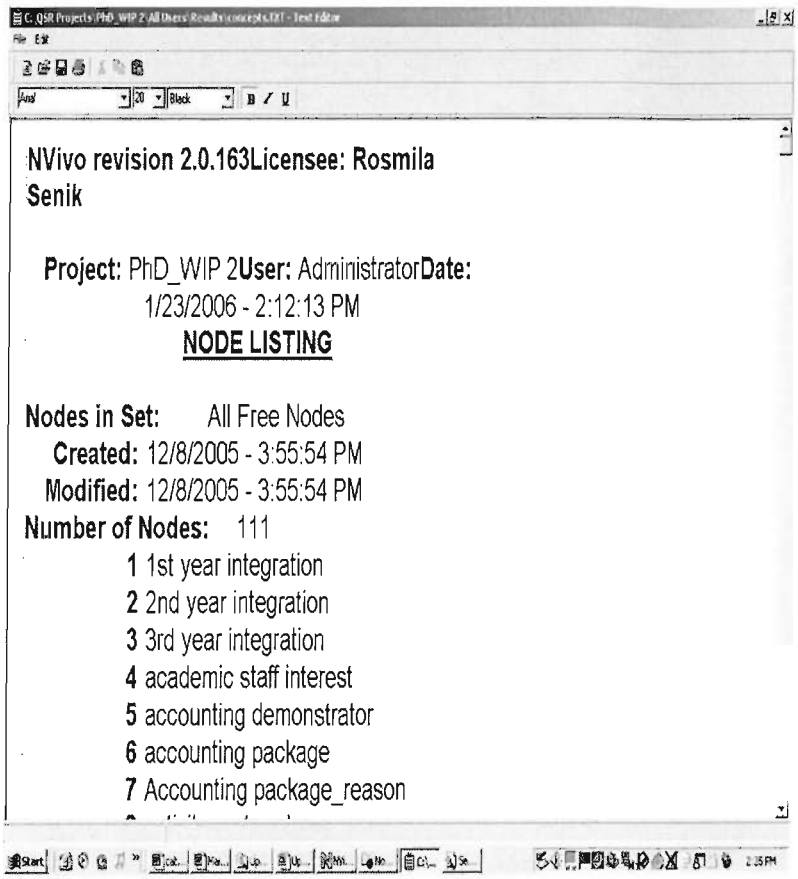


Figure 5-4 : Sample output of Nvivo – List of open concepts

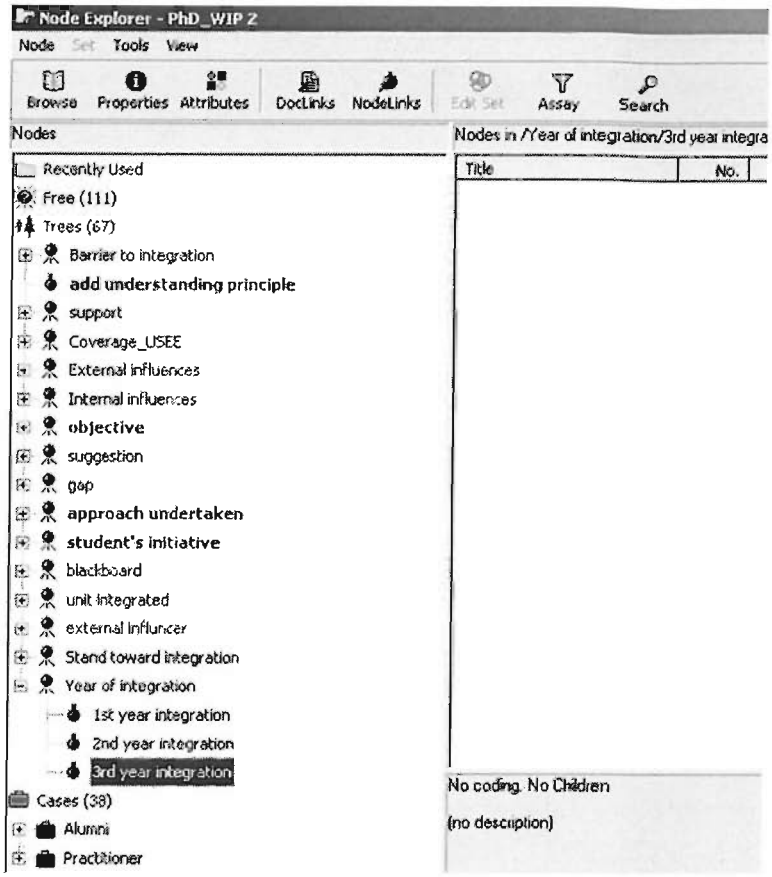


Figure 5-5 : Sample output of NVivo – List of open category

From the process, one hundred an eleven open concepts emerged, which later developed into twenty open categories, as presented in Appendix L and described in detail in Chapter 6 .

5.11.2 Axial coding

The axial coding stage is the process of systematically developing and linking categories and subcategories to uncover relationships among them and to further develop categories (Strauss and Corbin, 1998). The relationships among categories and subcategories were established from the data as perceived from the respondents' point of view through a constant comparison method as follows. First, the ideas of respondents were exploited and interpreted from their point of view. Secondly, the idea from one respondent was constantly compared to other respondents and finally a combination of the respondents' and the researcher's interpretations were made according to the information gathered.

Links were also made within a conditional structure, to evaluate how they relate to a process, which in this case is IT development in an educational programme. In doing this, the main analytical tool used was a paradigm model consisting of four main

components: causal conditions, intervening conditions, core phenomenon and consequences. Conditions are a set of issues that either create or prevent the occurrence of the phenomena. The core phenomenon is the phenomenon that explains the whole process, and consequences are the result of the main phenomenon. The components are thoroughly discussed in Chapter 8. In the process of axial coding, seven main categories were developed from twenty categories as presented in Appendix M, and explained further in Chapter 8.

5.11.3 Selective Coding

The selective coding stage involves 'the process of integrating and refining categories' (Strauss and Corbin, p.143), to discover a main phenomenon that represents the main theme of the research, which could be a foundation to develop a general theory. A question of what is the main story of this research was frequently asked and the criteria for choosing a central category as guided by Strauss and Corbin (1998) were highly considered. Among the criteria are, relation to all main categories, frequent occurrence in the data, logical and consistent explanation of the links without forcing of the data, abstract name(s) or phrase(s) used to describe the central category, depth and explanatory power, and ability to explain variations

After recursive reviews and refinements of the categories and their relationships and continuously weighting them against the actual data, one core phenomenon of the research was selected. The core phenomenon of the research was conception-driven IT skills development, which will be fully discussed in Chapter 8.

Throughout the process, the main analytical technique of constant theoretical comparison was constantly pursues, where data from respondents, document reviews as well as observations were analysed and compared using line-by-line analysis (microanalysis), especially in the first two stages. The process involved going through each line of the transcripts and documents and identifying every emerging concept, and any similarities or differences between the issues. The emerging issues and analytical thoughts were recorded using a memo. In the latter stage, paragraph-by-paragraph and whole document analysis was increasingly used, while line-by-line analysis was not totally ignored, especially when confirmation on certain issues was required. Last, but not least, continuous discussion and debate with supervisors and colleagues throughout the whole data analysis and data collection process became an important contribution towards a better understanding of the phenomena.

5.11.4 Validation

All the way through, validations of the outcomes of analysis were constantly made, as that is a crucial part of theory building. Validation in this study did not involve any quantitative testing, but was performed through certain initiatives (Strauss and Corbin, 1990, 1998). One of the initiatives was necessary modification based on comparison and further validation against the outcomes and actual as well as any new data. The products from rigorous constant comparison would ensure good theory generation (Strauss and Corbin, 1990, 1998). Another way was open and formal presentation of the outcomes to a group of educators and their feedback on how well the outcomes matched their conditions in general, helping to validate the outcomes. The outcomes were also presented to some practitioners, including alumni.

5.12 Conclusion

Implicitly or explicitly, there is a set of philosophical beliefs or paradigms behind any accounting research. Accounting research as part of the social science is based on the assumptions of the nature of the social world. The differences between the subjective and objective views of reality and the world lead to different approaches to accounting research (mainstream, interpretive and critical). No approach is dominant, and it all depends on the matter or situation studied (Tomkins and Groves, 1983a, 1983b, in Ryan *et al.*, 2002). Research in this thesis is informed by the interpretive approach and grounded theory. Besides the ontological and epistemological beliefs underpinning the methodological choice, it was also strongly believed that the approach could contribute towards an understanding of the process of enhancing information communication and technology in accounting education.

Chapter 6

Open Coding

6.1 Introduction

This chapter presents the focal research themes emerged from the data collection and analysis. It then discusses the main activities involved in the first analytical procedure of grounded theory (Strauss and Corbin, 1998), namely open coding, in generating open categories. The remaining sections of the chapter describe each of the generated open categories.

6.2 Emergent research themes

The preliminary data collection and data analysis led to the identification of emerging themes relevant to the area and important to participants. Reflection on the data collection activities, and overview of all documents and transcripts led to general understanding of the important issues raised by the participants. The emerging themes guided the subsequent data collection and analysis. The focal emerging issues were as follows:

- Perceptions on the importance of IT skills development in accounting degree programmes (ADP)
- Participants' IT skills expectations
- Perceptions on current coverage of IT skills in accounting degree programmes
- Factors influencing integration
- Issues facing integration process
- Perceptions on gaps

The emerging themes gradually became clear as the data collection and analysis progressed to open and, axial coding and particularly when the analysis reached the stage where a substantive theory was evolving.

6.3 Generation of open categories

An example of categorising was briefly illustrated in section 5.11.1 of the previous chapter. Once the documents and transcripts had been prepared, they were thoroughly reviewed line-by-line to identify the initial concepts. The concepts were

identified and explored in terms of their attributes significance to respondents and relevance to the investigation. They were then labelled. At this stage, the Computer Assisted Qualitative Data Analysis Software (CAQDAS), Nvivo was intensively used. Figure 6-1 shows an example of identifying and labelling concepts using the software.

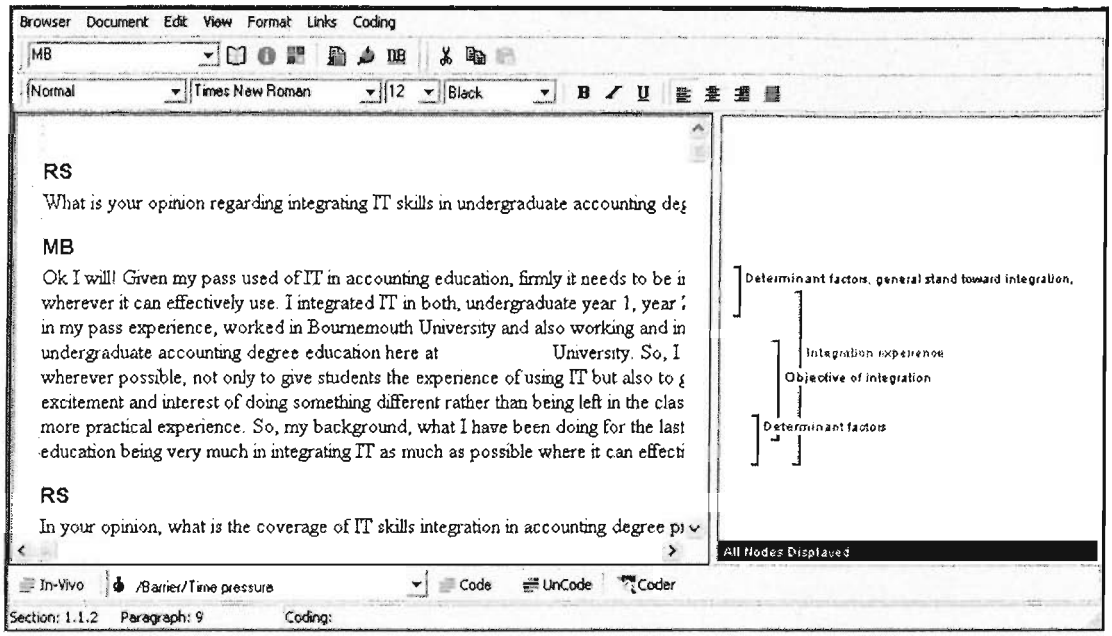


Figure 6-1 : Sample of identifying and naming concepts

All the documents and transcripts were revisited and rigorously compared several times to discover the concepts. In addition to reviewing the original transcripts and documents, the documents created by Nvivo, were also read, for example, the document that accumulates all the data under the same concept. This document was very helpful in comparing data from different respondents and to further uncover features of the concepts and understand the story behind them. In this process, a great number of concepts were identified.

Once the concepts were accumulated and constantly compared in terms of their commonalities and differences, they were then classified into categories, which represent or explain certain phenomena. Beside analysis by constant comparison, what? where?, when?, who?, why? and how? questions were frequently asked to identify and develop subcategories, to clarify and explain the categories. At this stage, many tables and diagrams were created to explore the data and capture the theoretical thoughts. Figure 6-2 to Figure 6-4 show samples of the diagrams and tables used in the categorising process.

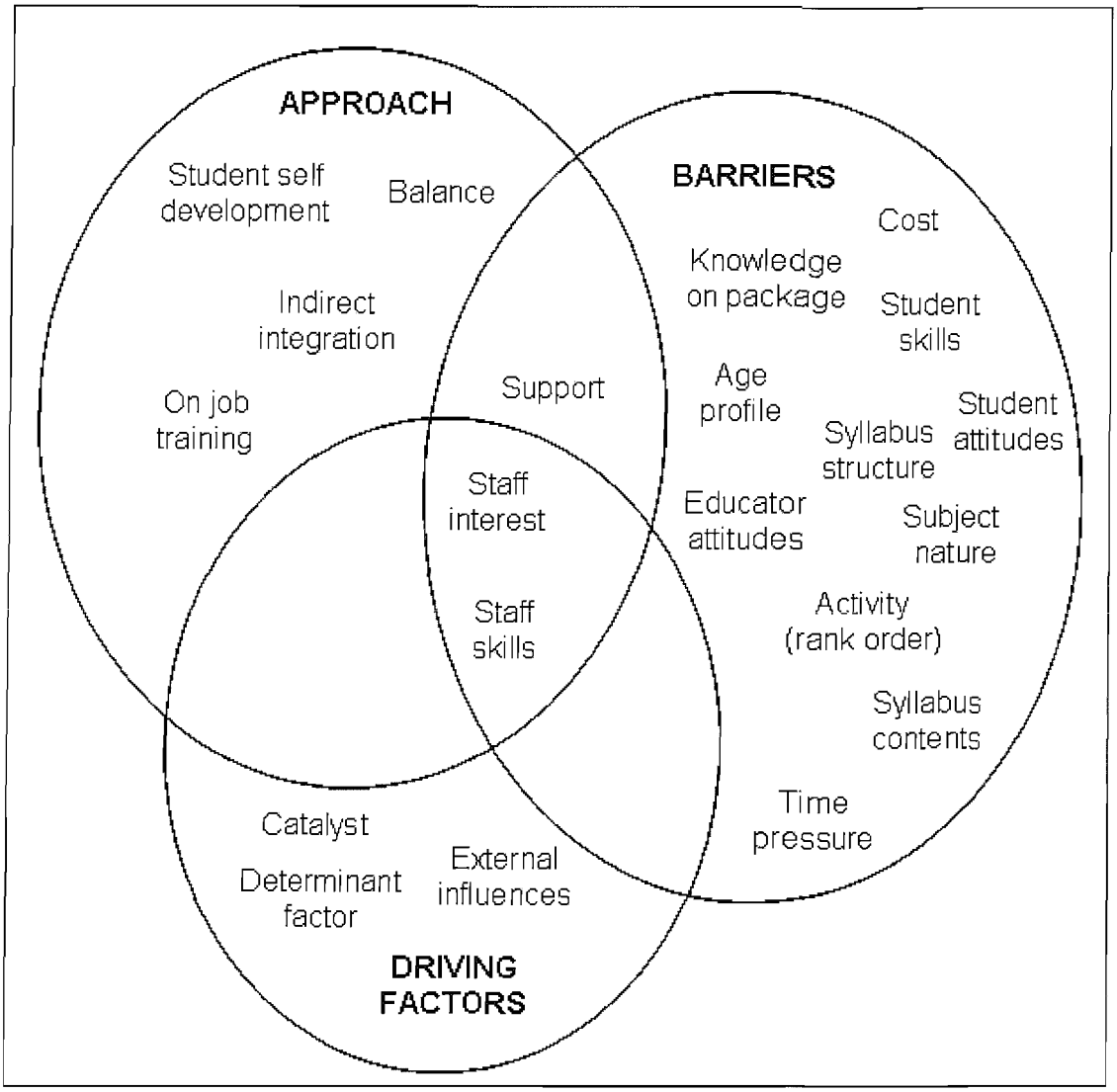


Figure 6-2 : Sample categorising work I

Figure 6-2 diagrammatically illustrates the process of grouping the concepts into categories. A mapping technique was used to capture the theory on analysis of the properties and dimensions of the concepts and on comparison among different respondents. Another way to capture the analytical thought is using matrices, as illustrated in Figure 6-3, which shows the attributes of several concepts later classified as support, approach, barriers and motivational factors.

Open Concept	Open Category			
	Support	Approach	Barrier	Motivational factors
Balanced right		✓		
Indirect Integration		✓		
On Job training		✓	✓	
Catalyst				✓
Student self development		✓	✓	
Barrier			✓	
Support	✓	✓	✓	✓
Type of university		✓	✓	
Syllabus structure		✓	✓	
Time pressure		✓	✓	
Demonstrator	✓			✓

Figure 6-3 : Sample categorising work II

The matrix shows the manner of categorising concepts according to common properties and dimensions. For example the concepts of 'balanced right', 'indirect integration', 'on job training' and 'student-self development' are concepts that have a common attribute that explain the phenomena of approach to skills development. Concepts can belong to more than one category, depending on its position along the dimensional scale, revealing its relationships with other concepts and categories. For example the concepts of 'on job training' and 'student-self development', mentioned earlier both belong to a skills development approach, but may also be considered as barriers in the sense that when educators assume them to be an approach to skills development, it may influence their style of teaching in a detrimental way. Figure 6-4 presents another example of categorising, and identifying subcategories.

Open concept	Property	Dimension	Dimensional range	Subcategory		Links cat. /sub
Type of university	Barrier	Type of univer-sity	Old - new	What are the barriers?	Type of university is one of the barriers	Link to nature of syllabus and time pressure
Priority - understanding principle		Teach-ing focus	Academic - vocational	Which type?	An traditional university appeared to prevent development	
Conceptual understanding vs. Vocational skills				Why?	-Teaching focus -Task priority -Recognition	
Activity rank order		Priority	Research – teaching – administrative	How does it prevent skills develop-ment?	-Focus on academic understanding instead of vocational skills development -Priority to research	
				Who?	Educators at traditional university	
				Whose opinion?	Almost all educators from all three schools	

Figure 6-4 : Sample categorising work III

The figure shows further category analysis of barriers according to type of university.

Again, it is stressed that all documents were revisited frequently. Although interview transcripts were the primary source of data, documentary and observational evidence was also useful in informing many of the issues. From this process, twenty categories, which were considered as core, were finally developed. Appendix M presents the open categories and the major concepts that form the categories. The following section describes the categories.

6.4 Open categories

The aim of this section is to explain the categories in detail, based on the data. The explanations focus on properties and dimensions, even though they were not clearly stated. The subcategories, which actually further elaborate the categories are normally presented in the sub-sections. Some concepts appear in more than one category as mentioned earlier. In many cases, explanations are supported by sample quotations from the transcripts. The quotes from different respondents are used to support the issues from a diverse source. However, some quotations appear to come from similar respondents because the respondents are those that express the issue most succinctly. As the main focus of the research is the accounting programme, information from other programmes is added only when relevant. At this stage, what follows are not theoretically related to each others since their relationships are the subject of the next two chapters.

Each of the open categories is now discussed under the six emerging themes (sections 6.5 to 6.10). Although some of the open categories represent more than a theme, they will discuss only once under the most relevant theme to avoid redundancy.

6.5 Perceptions on the importance of IT skills development in accounting degree programmes (ADP)

The categories of 'attitudes towards IT skills development', 'responsibilities for IT skills development' and 'respondents' understanding of IT skills integration' will be discussed under this theme.

6.5.1 Attitudes towards IT skills development

This category is about the perceptions and views of respondents on the importance of having IT skills development in the accounting degree programme. All groups of respondents (educators, practitioners as well as students) firmly expressed their opinions on the importance of IT skills and their development into graduates. They saw them as being important to extremely important. Almost all of them viewed it as very important. One respondent said:

> *"Well I think it's very very important, students doing Accounting Degree have or improve IT skills during the course of the degree they study in."*
>
> [Accounting Educator R]

Another said:

"...It's absolutely fundamental, I mean that everybody who does any kind of work whether it is managerial or involved in information processing, as in accounting does, needs to be able to use all the tools possible to do that, that are obviously the whole business of computing and use of software is fundamental to be able to do the job. So, clearly, it is extremely important that it is integrated."

[Accounting Educator N]

One student said:

"They [IT skills] are important, because nowadays everything we have to use the computer... "

[Accounting Student Y3_P]

Practitioners also acknowledged the importance of IT skills in the present working environment. Some of them, particularly the one involved with recruitment activities preferred other skills developments, such as leadership, team work and communication skills, perceived as crucial skills in fulfilling roles in any accountancy field. They were willing to accept less coverage of accounting technical knowledge and IT skills and look for more development in fundamental skills for graduates. For them, IT skills could be further developed while working, through training, based on the identification of skills that are lacking. Furthermore, they perceived that graduates were considerably capable in terms of IT skills, or at least prepared to acquire relevant skills when required.

"Oh! No, I don't think so [not to include IT skills in selection criteria]. As I said earlier, for me, the key skills that I find it harder to find are the leadership skills, the real motivation, and personal drive. Em, it is all about communication skills and team working. That for me, at the end of it, we will teach people the IT skills that they need in their job. What you can't teach people is motivation, you know, their own attributes, sort of personal, that sort of skills are more difficult to teach than IT. So, I would happily teach people IT skills but what I need is to have you know kind of individual that I can work with."

[HR Senior Manager]

"IT is not the important criteria considered in hiring a new recruit. Personally, it is fundamentally more important that they have good communication skills, they are really interested in business and obviously the academic ability to be successful in the professional exams that we set them to do. So you know, IT skills are important you know, what do I need them to do, I need them to communicate with clients, I need them to work in the team, yes, I need them to do the basics of the job, but at the end of it we will provide any IT training, and to be fair, most of the guys that come joining us are IT literate, you know, they can use Lotus Notes, they can use spreadsheets, they can use Word or Excel or whatever."

[HR Senior Manager]

However, more senior practitioners dealing with day to day operations emphasised the lack of IT skills among graduates and were looking for more IT skills from graduates to be able for them to carry out their tasks in the modern working environment.

From the feedback of respondents, the reasons for the importance of developing IT skills in accounting graduates can be grouped into two categories. The first main reason is the IT-based working environment, which leads employer to demand more IT skills-based graduates.

"For accounting, there is also an issue of teaching IT, as the skills that are asked for in the profession, as an accountant and they are much more convincing."

[Accounting Educator D]

"I suppose integrating IT skills is a case in any programme this day. I supposed it has various applications in the accounting area that it might do elsewhere and certainly because so much accounting is IT based now in terms of the software that available to perform a lot of accounting functions instead of have to do that manually. So the working environment is very IT based."

[Accounting Educator W]

The second reason is the high expectation of students as regards developing IT skills in their degree programme. Nowadays, students are widely exposed to IT either at home or at school. Hence, educators believed that the students have a high

expectation of IT skills development in higher education to prepare them for an IT-based working environment.

> *"I think it is certainly needed these days. That is self-evident these days. I think we are facing a changing cohort, the students, postgraduates and undergraduates, where their expectations of IT are higher, anyway, so I think we are in complete honest to respond to that ...."*
>
> [Accounting Educator D]

> *"And obviously a high level of IT skills, knowledge, is acquired by the students as part of their degree."*
>
> [Accounting Educator D]

While a few students had no idea of what IT skills are required by employers and showed no interest in obtaining them, some students were looking forward to developing IT skills through their degrees to gain competitive advantage. Some were aware of the importance of IT skills, the advancement of IT and the development of skills by their colleagues in other HEI.

> *"I can't see how if we weren't to learn some IT skills in our degree that when we actually finish in 3 years' time we will be at the level, the level, same playing field with other students from other universities. You have to have IT training in such accountancy programmes because what employers are looking for is obviously your degree, where do you get your team work and stuff like that but also good knowledge of IT in the actual programme that you are going to be using, that you might be using in your future career and I do expect to learn some new skills that I don't currently possess from the accounting degree.*
>
> [Accounting Student Y1_C]

6.5.2 Responsibilities for IT skills development

This category is about views on whom or what parties should be responsible for developing IT skills in graduates. Based on the feedback, the responsibilities appear to be as follows:

6.5.2.1 The responsibility of students

Some educators and employers assumed that students are responsible for developing their IT skills as needed on their courses. The way they develop them is totally dependent on them. Some educators required students to perform presentations using presentation software without formal teaching on that software. Some educators gave out work involving calculation and assumed that students would use a spreadsheet to achieve that. They assumed that students would make an effort to develop the required skills to complete the course assignments. A few students spoke of their experience in developing some IT skills, such as using PowerPoint and more advanced uses of Excel, because the skills were required to complete their coursework. Some students had developed their IT skills, out of their own interest. Many of them expressed their preparedness to learn and develop skills on their own on condition that software and related facilities were provided by the university in the library or in departments.

6.5.2.2 The responsibility of employers

Many respondents gave the opinion that employers should be responsible for developing IT skills, as part of the job. Educators relied on employers to develop such skills and they focus on conceptual subject matters. Furthermore, educators seemed to believe that individual firms use specific IT systems, tailored and uniquely applicable to the firm. They believed that, there are different applications used by different organisations and it was impossible to cover them all. On the other hand, it was difficult to choose a particular system, since the students might join companies using different systems. Thus, many educators took the above reason as a strong argument for not including any accounting or auditing packages in the related taught units. They as well as some students expected that job-related skills should be developed during job training instead of in higher education institutions.

> *"I would say that they would get it [skill on using the accounting package] on job. Not only that. There can be a lot of different packages on the job. Thus, I suppose employer will train them."*
>
> [Accounting Educator T]

Employers guaranteed appropriate IT skills training for their employees at recruitment and when needed. Most of the accountant trainees and alumni said that they did not

have a problem developing the IT skills required, as they were able to learn and develop through a formal training programme or through mentors.

"You know, while we are training in accounting-related job, we also focus on developing our IT skills at the same time."

[Alumni 2001_M]

6.5.2.3 The responsibility of educators

Employers, students and educators agreed that some IT skills could be developed through courses in higher education programmes, and it is the responsibility of educators to provide a context that helps to develop certain IT skills.

"I think yes, you can [develop IT skills in higher education]. It is absolutely a very teachable subject. And, you know, that is absolutely the way. I would expect the people to come to us with, who are very computer literate."

[HR Senior Manager]

6.5.2.4 The responsibility of student support centres

Some respondents believed that graduates could develop IT skills in higher education institutions through student support centres without depending on formal IT skills integration by educators. Some educators conveyed that there should be student support centres that could provide courses on IT skills development to students. Some students also expressed their expectations on support provided by the university through the library resources or computer centres to help them develop skills.

The following quotation shows an expression on students' responsibility

"I am here to teach accounting, not IT. No! No! No! I am not going to tech them IT. I expect students learn by themselves or they can ask from student support centre, like learning other skills."

[Accounting Educator A]

It emerges generally, that all parties are responsible for skills development of graduates. Educators provide context, students take their own initiatives to identify required skills and learn them, and employers train new recruits, particularly those

specific skills applicable to the company. Student support centres in higher education also have responsibilities in developing students' IT skills either by providing the facilities, such as software and hardware, or conducting relevant skill training required by students.

6.5.3 Respondents' understanding of 'IT skills integration'

This category reflects respondents' perceptions about IT skill integration, across issues, such as using IT as educational technology to issues of developing IT skills required by the accounting profession. Respondents always referred to these two main issues when giving opinions on IT skills integration.

6.5.3.1 Using IT in education

Most of the educators referred to IT in teaching, especially the use of Blackboard, regardless of whether or not they used it in their lessons. Blackboard is a web-based service supported by Information System Services as an electronic educational platform, providing facilities for educators to deliver course materials. It can be accessed on the Internet by students at any time. It has interactive features, such as online tests and discussion boards. Some educators did not utilise it, but increasing numbers were starting to use it, at least to post course materials. Some educators used other Blackboard functions, including online tests, discussion board or forum. The educators found the discussion board useful to manage issues raised by students, which other students also benefited from. Educators were able to schedule the time to read and answer the questions. Some students took advantage to pose questions related to assignments. They also appreciated the availability of the course materials and other related information or announcements on the Blackboard.

Besides these positive responses, some educators still doubted the benefits of Blackboard. They expressed their disappointment about students not participating enough. On some courses, students did not really use it or participate in discussion. They did not even access important materials given on the Blackboard. Some students also expressed disappointment about some other courses providing little or no material related to the courses.

Another issue raised by one educator related to the use of the Blackboard was that of transferring the costs to the students, since the students had to print out themselves instead of receiving handouts. Furthermore, one educator also thought that having everything on the Blackboard, was an excuse for students' non-attendance.

However, the majority of educators and students felt the benefit of using the Blackboard as a platform for communication and distribution of course materials (not as a replacement for conventional lectures). Although they did not see it as a direct way of developing the IT skills required by employers, it exposed the students to some IT skills, such as using the Internet, online discussion and forum participation. Furthermore, when the educators used it in their teaching, students felt the importance of exposure to the technology and it encouraged them to familiarise themselves with it.

Another use of IT as a tool in teaching and learning was the use of CAL such as EQL.

> *"It [integrating IT skills in undergraduate accounting degree programme] is depending on what you mean by IT skills. I take it as the computer aided learning."*
>
> [Accounting Educator Y]

Again, the educators admitted that it is not directly IT skills development required by employers. However, they believed that it did expose the students to some usage of IT and indirectly developed some generic IT skills, important for students starting new careers. Some educators had already adopted CAL, but others still questioned the benefits of it. The first issue was whether it was really effective in developing students' understanding of accounting concepts and principles.

Another issue was financial feasibility (whether the benefits gained justify the cost of acquiring the software. Experiences showed that students were not using the software optimally and even only a very small number of students were using it. This perception was supported in the responses given by students on their experience with CAL provided on their course. The software was not widely used, as the students did not see its importance and it was provided just as an optional type of reference.

6.5.3.2 Developing IT related skills required by the profession

Some respondents referred to 'IT skills integration' as the issue of developing the IT skills required by the accounting profession. Students and employers focused more on this issue than educators, who emphasised IT integration as using IT as a tool in teaching and learning. However, all groups of respondents were aware of the career

importance of IT and the need to develop the skills before entering the profession. The students believed that having generic IT skills and some exposure to accounting-related packages would give value added and competitive advantage for them in getting jobs. Thus, IT skills were of real interest.

Most educators were aware that employers were looking for IT-skilled graduates. They also assumed that students were coming to a higher education institution with the high expectation of developing skills to prepare themselves for a working career. Thus, some educators felt responsible for developing students' IT skills through their taught units. There was evidence of initiatives and efforts from some educators to introduce students to advanced use of packages in taught units, such as the analysis tools in spreadsheet software and presentation software. In addition, specific software, @Risk, was also introduced, to expose students to software for job-related activities, such as assessing capital investment projects. In spite of the efforts, some educators felt they were not doing enough and could do more. They felt committed to strengthening conceptual accounting knowledge and other transferable skills, as well as team working spirit, life long learning and communication skills. IT would be used and its skills would be developed as long as it could effectively instil the conceptual understanding of accounting concepts and principles. However, educators were also unclear about what IT skills were required the employers and about students' expectations. They believed that skills related to particular packages and systems, tailored to a particular company, should be developed on the job.

From the perspective of the employers, they expected graduates to have some generic skills, such as familiarity in using office software, for example e-mail, Lotus Notes and a word processor. They saw those as common skills that graduates should have, either through their formal degree programme or informal acquisition, such as at home exposure or in self-learning. Based on the responses of employer who involved in graduate recruitment and graduate recruits, they preferred higher education to focus on development of other competencies, such as leadership, communication and teamwork, rather than specific, advanced IT skills. Those skills will be acquired later with training as and when required, mostly on the job.

The feedback from respondents showed that all were alert to the importance IT skills to their working career, but none were clear about the IT skills required and should be or could be developed in higher education. Generally, at par, all views that the graduates should have some transferable skills and generic IT skills. The skills could

be developed through the teaching units in accounting degree while the specific IT skills should be developed by employers through job training.

The above discussion shows that all respondents have positive attitude towards IT skills development of graduates because of the changing working atmosphere which moving towards IT-based environment. However, they have different opinions regarding who and where the skills can be acquired. The responsibilities can be falled into students themselves, educators, employers or students support centres. In general, they viewed that basic IT skills, including general understanding on accounting package can be developed in higher institutions while the specific skills can be developed through on job training. They view IT skills as both the skills in using IT in learning and the skills in using job-related IT packages. The next section discuss on open categories, which give a picture on skills expected by the respondents.

6.6 Participants' skills expectations

This theme covers the open categories of 'expected skills to develop', 'skills possessed' and 'selection and recruitment criteria'.

6.6.1 Expected skills to develop

This category represents respondents' views on what IT skills could be developed through an accounting programme in higher education. In the interviews, neither students nor educators nor employers knew exactly what skills should be developed and how the development process should be undertaken. However, they were expected accounting graduates to have some familiarity with IT applications. Among the applications suggested by respondents are:

6.6.1.1 A financial accounting package

Most students expected that they would be given a sample of an accounting-related package. Almost all of them expected to learn and use IT-based accounting applications, particularly in recording accounting information in financial accounting units, taught during the first and second year of their studies. Although most of them did not have any idea of the appropriate application, they were aware that, in reality, most firms perform tasks using a computer-based system. Furthermore, some of

them were convinced that their colleagues in other universities had been introduced to and used an IT-based application. Thus, they expected the same. Despite of this, they agreed with the need to have a strong conceptual understanding of accounting principles and admitted that the course had provided them with enough training in paper and pen based exercises. However, they suggested substituting some exercises with computer-based applications to expose them with the actual practice. They also argued that, although there were different systems available and used by different organisations, they believed that being exposed to one system would help them to use other systems, since they believed the systems were similar in fundamental principles and concepts.

> *"If you learn stuff in one of them [accounting systems], you can pretty much apply it to another…they are all pretty much similar at the end of the day"*
>
> [Accounting Student Y3_J]

> *"Mainly accounting ones really. Use the accounting programmes in financial accounting or something like that."*
>
> [Accounting Student Y2_C]

> *"Now, we know the basic, double entry, balance sheet, and how to do them. It might be a good idea to incorporate that into the computer in the last year"*
>
> [Accounting student Y3_P]

Educators had different views about integrating an accounting package. Some educators had expressed similar thoughts as the students in terms of an accounting package in the financial accounting units; some assumed they already had that in the current programme as in other universities.

> *"I thought that colleagues do use accounting packages, do they not? It is a good idea that they should, I think that, I expected they were."*
>
> [Accounting Educator W]

Similar thoughts also expressed by some educators when they argued for the introduction of accounting package to expose students to actual working environment practices. They believed that the benefits gained included students' understanding of accounting concepts and principles.

"...I think SAGE is quite an important package, love to see it in there [Financial accounting unit]). And love to see some coursework assigned to it as well. And I think it provides the students with a tremendous understanding of the, erm, theoretical understanding of double entry bookkeeping, how it works in practice. And so clear case again how IT been integrated reinforces conceptions."

[Accounting Educator B]

Despite favourable thoughts on having an accounting package in financial accounting units, some educators felt it was not necessary to integrate it into the syllabus, since the students would be trained later on job. Some were still doubtful about integrating any accounting package in the units, for reasons of tight syllabus content, emphasis on conceptual understanding, the availability of many various systems and other reasons discussed in section 6.9.1.

"No! I don't think that will be very beneficial in the teaching process. Because what you learn from it, will be not much more than what you can get from the teaching package. As long as they are familiar with the IT uses, processing transactions and producing certain results in trial balance, then they should be able to cope with the accounting packages. And I do see there is value in it, but I don't see there is sufficient value to spend amount of time [to teach student on accounting package]."

[Accounting Educator T]

"I am very concerned about the limited time we have available for teaching financial accounting. It is a constraint, automatically, that we don't spend time teaching them specific packages, but we do spend time teaching them accounting principles and the underlying concepts. If we do that together, at the same time, fine, but I don't want to spend time going on learning a particular package, which may not be appropriate in two years' time. That doesn't actually add up anything to their underlying understanding of accounting principles. It is suggested from time to time, and we talk about whether we should try opening it perhaps in the second year, when there are only accounting students, but given the amount of time that are available in the degree course at the moment, colleagues have been decided that within the liberty, we are not spending time learning the particular package."

[Accounting Educator E]

"I think, it is far more important that the people get a good conceptual understanding of what accounting is about rather than they learn to do that using today's software package. You know, in three years time, the software packages [may be] different. So, I am not sure it would be any great help."

[Accounting Educator N]

Some educators agreed with students regarding the various choices of systems used by different organisations. They argued that systems were not different in basic and general concepts, allowing the students to quickly get familiarised with any systems.

"... Erm but even if we integrate something like SAGE, you could argue that SAGE is not Quick Book, is not [Quicken], is not PEGASUS, but understanding how an invoice works, some work in the back office and double entry bookkeeping is, and there's something on how to do journals with a number of ledgers, and that's generic to Quick book, Quicken, PEGASUS, and SAGE. So there are general principles in IT skills, which we are giving to the students, which can be transferable to other packages within the area."

[Accounting Educator B]

"The general idea is to be able to use the computer and get acquainted with how to use it. With all sorts of packages, get used to what computers do get into their little minds, so you can apply that when you get something different to use, whatever they happen to be using..."

[Accounting Student Y3_V]

Some of the accountant trainees interviewed as well as alumni, both trainees and certified accountants, expressed their expectations and suggestions about the inclusion of an accounting package in the degree programme. They believed it was good exposure for students, as they going to use it in real practice.

"May be some accounting systems, I know "Prophecy" [accounting system used in that particular organization, in which the alumni 2002_L work], you know thing like SAGE, or other accounting programmes, should be erm included in the course, or may be something that you use in the real world. Erm I think the problem with that [accounting package] is that a lot of organisation use a varying programme that might be difficult to teach in the course. But may

be at least a knowledge about what [are the systems] and how they are used. As a student, it might be beneficial, give you an idea before you go to a work space, sort of what it is alike, how these things are works and so on."

[Alumni 2002_L]

Although they were working for big 4 companies, they were very much exposed to the simple systems like SAGE as it had been widely used by clients. Their experiences were reflected in the statement made by one of the educators as below:

"Yes, I mean I mentioned SAGE earlier, erm I have experience and I taught SAGE and PEGASUS in both accounting undergraduate courses in the past. It's not here. It's finding the space, hopefully within the financial accounting units where SAGE could be used. And then you could argue that the major firms don't use something like SAGE, but if the students are going to go to a major firm and going to do audits in a small company, then it's quite likely that the small company is using something like Quick book, or SAGE, or PEGASUS. So, this is a strong argument why something like SAGE should be used."

[Accounting Educator B]

This issue was confirmed by alumni as in the following quotations:

"The overall programme [Accounting and Finance degree programme at UUI] is good. But I would say it should include computer package such SAGE. It is a good exposure for students"

[Alumni 2005_J]

"Many clients that we go to audit use SAGE."

[Alumni 2001_S]

6.6.1.2 Auditing and tax packages

In addition to software that helps to record business transactions and produce information for annual reports, some respondents, including educators and students, saw the potentiality for introducing auditing and tax packages in relevant units. Some alumni also shared the view that it was appropriate to complement the conceptual parts in auditing and tax units with some introduction to the related software. Thus, addition to knowing the theoretical part of auditing and the availability of auditing

packages, students would also have some experience of doing audits using the software.

> *"Well it will be justifiable if it gives students that sort of practical experience that you don't get otherwise, because auditing is a very odd topic really to teach in a university, because you teach it sort of from a theoretical context. Students don't do it even on accounting course. They do accounting even though it is sort of a very artificial context preparing accounting statements in 40 minutes piece of information. But auditing is something that, yes, there is a substantial conceptual element to it and increasingly, as auditing becomes regulated, it's standard but having a little bit of hand s-on experience is I think a very useful supplement to an auditing course."*
>
> [Accounting Educator R]

A few current accounting students also expected that they would use auditing as well as a tax package as some of their colleagues in other universities had been using it. Personally, they thought it was feasible to learn auditing through diverse theoretical, conceptual approach as well as practical approaches.

> *"I don't see why they can't sort of do the actual real life, teach the principles, the theory part of doing accounting, auditing, then teach how to do it at the same time, using the actual package on the computer. See! You sort of like using actual stuff but then you have got understanding there, telling you what it means...even if they got like people from companies to come in and do it for like auditing, show you how to use computer stuff. Then, I suppose university has got to have the software to do it which I don't suppose they have got"*
>
> [Accounting Student Y3_J]

Some educators saw the possibility of using the same packages in financial and auditing units as some of the accounting packages had more advanced features, besides the recording function, including the features for doing an audit trail. Thus this package could be used in the financial accounting units as well as the auditing unit and it would be justifiable, in terms of cost. Although some universities had developed their own packages, some educators suggested that it would be better to use packages already available on the market instead of developing new ones.

6.6.1.3 Management accounting-related applications

Some educators suggested more exposure to IT-related applications dealing with management accounting issues. They were aware that students had been introduced to some IT applications in management accounting units and felt that the initiatives were manageable and successful. In other words, the applications were well integrated without reducing other important content on the syllabus. However, they felt that the use of IT applications was still low and felt the potential for introducing more IT applications on the syllabus, such as applications for performance measurement, for example balanced score card systems and simulations concerning decision-making related to management accounting. They believed that there should be packages suitable for educational training available on the market that could be used in management accounting units. They were also aware of cost implications, but believed that arrangements could be made with suppliers for better offers for educational institutions.

> *"I expect more about the financial modelling particularly, I mean because management accounting is obviously my main interest, I better stick to that, and yea, we don't do much, I mean apart from, we do a little bit in first year, at the end of their first year, and we do a little bit when they do management accounting in the third year with [Name of Educator], when he does capital investment. I'm not aware there is a huge amount of other IT which is included in the content of the programme. And certainly in the second year, third year, we can do more..."*
>
> [Accounting Educator D]

6.6.1.4 Excel

Most of the respondents stated that there was some integration of Excel in the current syllabus. However, both educators and students thought it could be spread out over more units, to give students more contexts in which to use it. Some students thought that they were quite proficient in Excel, but observation showed that some of them still needed training in more efficient and proper ways of doing it. For example, many students were inserting their own formulae to calculate internal rate of return (IRR) and net present value (NPV), since they did not know that the functions for the formulae were readily available as one of the software features. Many of them did not even know how to insert formulae, format or update the spreadsheet, such as delete

rows, format a range of cells and so on. Some of them did not even have previous experience of using Excel.

Thus, in terms of coverage, some students suggested that the introduction to Excel should begin with its basic functions, including formatting and inserting formulae. This is because some of them did not have experience in using it, and needed to be introduced from the basic. In addition, a student who had gone for industrial training thought that some of the coverage of Excel was too advanced compared with what they were using at work.

> *"From my experience, when we go into the job, everything is very very Excel based and we are taught a lot of complicated Excel stuff. We are not taught the basics of what we need at work. It is not about dealing with regression and things like that... it is more about creating and formulating a readable clear table"*
>
> [Accounting Student Y3_V]

However, some students felt that the lessons in Excel gave nothing new to them, since they already had the skills. This group of students was looking for other, new skills. As a result, educators were faced with difficulties in developing the skills, to meet the diverse levels of student skills. Some students expressed unwillingness to spend time on skills that they already possessed. One suggestion raised by students and educators was to have regular reviews, such as an assessment conducted at the beginning of the university session, to identify students' levels of skill, so that they could be assigned to the right group and trained to the right level. In addition, a foundation level course in using Excel could be provided to cater for those who needed it.

> *"Errr and obviously that will vary from time to time, students' level of IT skills that they are coming with have varied and increased in the last few years. We need to be constantly reviewing what we need to offer them and take forward and we are doing what they actually need in the programme."*
>
> [Accounting Educator R]

Regardless of skill levels, most students as well as educators saw the need to have more room to use the applications throughout their studies, since they believed that

one of the ways to develop skills is through continuous use of the applications. They also placed emphasis on developing the skills related to accounting field rather than general IT applications. The following quotation summarises some of the relevant skills that could be developed in the accounting degree programme.

> *"I think nowadays, it is appropriate for students to get experience of processing accounting data using standard accounting packages, to see how you can do with this, how you can manipulate the data and what you can produce in the end. That will be one context. A second context might be using a management accounting software, to deal with the processes, or some standard management accounting decision making that very often used to be done by hand , but now the software is there, I don't mean for the students doing it from scratch using Excel, setting up everything themselves, but just think software out there. And this is where perhaps some sort of on the margin because increasingly now there is a lot of erm both educational software and more generic software that deals with financial reporting at a more advanced level rather than just the basic bookkeeping level and it is the question they might have made for a number of years, should students perhaps, say doing consolidation, should they be doing that in the traditional manual method or should they be using dedicated software packages. I say that particularly because basically when I do a consolidation question, I use Excel and have a sort of fairly standard consolidation spreadsheet set up, so I just change numbers in there [laugh]. It saves a lot of time. Erm so that would be a possibility where something subject specific. And that won't just be in accounting, in Finance for example, where so much now is offered in practical investment decision making, it is done using a computer-based system. Some source of exposure there would be relevant."*
>
> [Accounting Educator R]

6.6.2 Skills possessed

This category is about IT skills possessed by students from their previous learning experience as perceived by them and assumed by educators. All educators expected students to have some basic IT skills when coming to higher education.

> *"I would think that most students, undergraduate students, were coming with most of the skills anyway."*
>
> [Accounting Educator T]

They had a high expectation that UK students would have basic skills in using common software, including word processing and spreadsheet software.

> *"As far as UK students are concerned, I can't generalize people coming from other parts of the world, obviously. As far as UK students are concerned, I used to take for granted that they have the basic skills, that they are able to use common programmes and things of that kind."*
>
> [Accounting Educator N]

Furthermore, they believed that the skills base of current students should be much higher compared with the skills of students several years ago, because of the exposure they had at school, college, home and their environment. This perception had influenced them to integrate IT skills into their teaching.

> *"My expectation now, when the students come for their first degree, I expect them and I assume they have been using Word processing packages, and Excel packages in high school and in college. I would be astounded if I found students that had never used Word processing, never used the Internet, never used e-mail, maybe not used Excel, but I hope they will have a skill base so much higher today, in 2005 and 2006 than they would have had in 1995, going back to that period. So, yes, I think my expectations have increased towards the students coming in. erm whether that is correct or incorrect to make that expectation in terms of Excel, I don't know. I think when we get carried away in terms of thinking of the IT skills experience of the students coming to higher education has increased because they all should be using computer packages at school and also at home, but whether or not they use some of the packages such as Excel I notice, isn't there, but I would expect they were improved compared to the last time. I would be surprised if there are the vast majority of students who never heard of Excel, who never heard of a spreadsheet, or never used it, but they might not necessarily have used the formula function within Excel. So, that's why we have this in year 1, a very general introduction, but it does step up quite a gear change in years 2 and 3 when they start building a model, and that's maybe a jump too far for the students but it gives them a challenge."*
>
> [Accounting Educator B]

Some students admitted and showed that they possessed some IT skills and expected their colleagues to have them too. The knowledge and skills commonly possessed by them or assumed to be possessed by them are described in the following sub-sections:

6.6.2.1 General IT knowledge

Most students considered they had general IT knowledge, for example could access computers, knew the components of computer systems, such as hardware and software, inputs and outputs, and so on. Most of them did not expect to know more about those things and thought it was not relevant to them as accountants-to-be. They felt that the details behind the computer systems should be covered by computer science and computer engineering students.

6.6.2.2 Skills in using word processing

Skills in using word processing were considered as basic IT skills that students should have learned before entering higher education. Most educators assumed students to have the skills and observed that the students did have them, as increasing numbers of students did class work on a word processor, even if they had not been asked to do so. Data from focus groups showed that all participants had skill in using Microsoft Word. They were quite confident of their skills in using Word, and most of them rating their skills as average as or more than average. There was one student considered himself to be expert.

6.6.2.3 Skills in using spreadsheet software

Educators had different views on students' skills in using spreadsheet software. Some educators had reservations about whether the students had experience using Excel before coming to university. Some believed that many students possessed the skills but a few did not. The different skill levels depended on how much exposure they had had. They assumed that the students at least knew how to use a spreadsheet to help them in doing calculation-based exercises.

All the students in the focus groups showed that they had abilities in using Microsoft Excel. With Word, they considered their skills in using Excel as being average to more than average. Some had learnt at school but some had not. From an observation of an IT-based class session using Excel for first year students, most of the students could use Excel, but only a few looked at ease using it and knew how to locate Excel's features. Many knew how to prepare a spreadsheet and insert

formulae. However, quite a number of students, including ones from China and Europe (including the UK) were unfamiliar with basic Excel's features, inserting formulae, copying formulae to other cells or creating graphs from a set of data. Some, especially those from China, showed their intention to learn and repeatedly asked questions. Others just sat quietly waiting for help.

6.6.2.4 Skills in using a database

Most educators did not expect students to come to university with skills in using database software. However, a few educators suspected that a few students might already be familiar with it. Only two students from the focus groups had experience in using Microsoft Access. They considered their skill's level as being average in creating and maintaining a simple database.

6.6.2.5 Skills in using presentation software

As with spreadsheets, some educators were not sure about students' abilities in using presentation software. They assumed it to be a necessary skill for students. Thus, a few of them had taken initiatives to encourage students to build their skills through preparation of presentation work. Almost all participants in the focus groups considered themselves to have skills in using PowerPoint. Some of them were quite confident using PowerPoint and rated their skills as above average or expert. Some considered their skills as less than average or just average. Some however, had not used PowerPoint until starting university.

6.6.2.6 Skills in using Internet and e-mail

Most educators considered students to be familiar with the Internet and e-mail. Most of them had experience in using the Internet and e-mail and assumed it to be a basic and common skill that students should possess. However, most of them used the Internet and e-mail primarily for informal communication with family and friends and other personal usage, mainly entertainment. They had started using them in a more formal way for educational purposes at university, particularly in finding information for course assignment and research purposes.

6.6.2.7 Conception of skills possessed by students

Some issues emerged relating to conceptions of skills possessed by students. One of the issues was whether the students really possessed the skills that they were assumed to have by the educators. In other words, did educators overestimate or

underestimate students' skills? Some educators found that sometimes students did not have the skills that they were expected to have. For example, there were students who were not familiar with spreadsheet packages at all. Thus some educators felt the need to probe students' skills to ensure they really had them, and, if not, provide them.

> *"erm I don't actually know what knowledge they have when they come in, but where I do see them, in their third year, in the past they seemed to using computer produced information, management accounting information, and the students were actually not, and that obviously, four years ago. Since last year, things may have changed. But they maybe very uneasy about their basic level, in their third year course. Just putting the information to them in the form of, in this case, is just a series of computer print outs. And they found it really difficult to read it and understand it, which is a bit disappointing. So, again I'm a bit concerned about making too many assumptions on what they know when they come here. Again I think maybe we need to find out more and then see what we need to add to it. It isn't clear at the moment."*
>
> [Accounting Educator D]

One way suggested by some educators and students to assess the skills possessed by students was through a standard assessment at the beginning of the first year at school or university level. From the assessment, students' skills could be identified, which would help to plan the relevant skills integration in the courses. They need basic general skills, such as using a word processor and Excel, and they could be given a separate workshop in an early semester covering those skills instead of having that class for all students.

> *"I think it would be more realistic for us to be aware of where we are getting, erm then us doing something, filling in the gaps, which might mean some sort of early audit of the first year undergraduate, to test their knowledge, and then coach them in the right direction and provide particular courses if they are needed, to bring everybody up to basic level by the end of second year. I suspect something like that is the most needed rather than try to say "Well! The school ought to be doing this.""*
>
> [Accounting Educator D]

Some educators had designed the integration in such a way that quickly covered low-level skills before gradually going on to high-level skills. They thought that this was a good approach, which could cater for all the ability range. It gave an opportunity to those who did not yet have the skills to start developing them, and to those already with skills could treat the class as revision or enhancement. Some educators and students thought it was unfair to ignore IT skills integration because a wrong perception that students already possessed the skills.

6.6.3 Selection and recruitment criteria

This category is about respondents' views on the criteria considered in the selection and recruitment process. The criteria were assessed through a written form and face-to-face interview. The criteria revealed in the interviews were academic degree, UCAS Point, experience and quality of the applicants.

The degree is one of the criteria that employers look into in the selection and recruitment process. Employers revealed that they would consider any academic background, including the sciences, arts, geography, history, engineering and so on, regardless of which university award the degrees. However, applicants must have a minimum of a 2.1 to ensure the academic ability for them to cope with professional training and examinations. It means that the applicants did not have to be Accounting and Finance students and those that were did not have priority in the selection process. However, Accounting and Finance students normally have higher weights in terms of showing their interest and understanding about business and industry, compared with applicants from other academic backgrounds, such as geography and history. Employers felt that this was because of the nature of the Accounting and Finance degree itself, which is closely related to business and industry.

Employers also found that Accounting and Finance degree students did not normally perform the best in their professional training and examinations. Some of them performed well in the first few papers, which covered their learning during their degree but were level with other academic background trainees for the rest of the professional training modules. It was evident in 2004 and 2005, when the best trainees for the ICAS professional training programme conducted by the firm came from geography and oceanography, in that order. Thus, any academic background would be considered, as long as the applicants met other important criteria, including UCAS points of 350, work experience and other personal qualities, as discussed next.

In terms of work experience, it matched with the job searching experiences revealed by some of the accountant trainees and alumni of the Accounting and Finance degree interviewed. They also confirmed that work experience was important, since those who had no working experience had difficulties in getting jobs, especially in the big four companies, although they had performed well academically. Many of the alumni who worked with the big four firms had actually done an internship programme with the firms during the summer term. Other interviewees with non-accounting related background had also experienced working with the firm before. For example, an accountant trainee who had graduated with a degree in Management had done an internship programme with the firm during the summer.

Another important criterion was the quality of the applicants. Employers were looking for candidates who appeared to have communication, leadership and team working skills. Employers found communication skills to be an important criterion, since the job involves contact with different people, inside and outside of the organisation. Candidates should demonstrate ability in preparing documents, such as reports, and in verbally communicating them with others. Leadership skills were important, since the job required them to take leadership responsibilities. As accountants regularly work in teams, candidates must show experience of group work, ability to tolerate others and so on. In addition, the candidates must also show interest in the business and accountancy industry and have some understanding of it. Besides that, they should also have a good academic performance as another requirement for the professional examinations. Last but not least, candidates must appear motivated and enthusiastic.

Based on the interviews, employers emphasised that the combination of the above criteria was important in the selection and recruitment process. Employers did not see IT skills as important and no assessment of those skills was attempted, whether prior to or during the interviews. This was because, based on their experience, they found candidates were normally equipped with basic IT skills and demonstrated that they could cope quickly with the use of IT-based applications used in the firm. Employers were also willing to provide IT training, since they perceived that as something practically feasible. On the contrary, they preferred higher education programmes to focus more on developing other skills, since they found it hard to find candidates with those skills needed when they joined the firm. The accountant trainees also believed that employers really looked into the criteria in selecting and recruiting new recruits.

"You [applicants] have to demonstrate sort of leadership skill, team working skill, erm communication skill, enthusiasm, I think it's on the website, they have sort of, I think it is 5 kinds of competencies they look for and in the application form, it asks you to give examples when you demonstrated those things. So, I think it actually much more weighted towards that"

[Recruitment Team Member/ Accounting Trainee_V]

They thought that IT skills were not a priority, since some of them did not have the skills when they joined in the firm. There was no difficulty, as they were trained to use the IT systems employed in the firm as soon as they were recruited. Moreover, they could ask for other training that they lacked. However, they perceived it was also good to have the skills to be able to quickly cope with the systems.

"...personally, it is fundamentally more important that they have good communication skills. They have real interest in business and obviously the academic ability to be successful in the professional exams that we set them to do. So you know, what is important, you know, what do I need them to do, I need them to communicate with clients, I need them to work in the team, yes, I need them to do the basics of the job, but at the end of it we will provide any IT training, and to be fair, most of the guys that join us are IT literate, you know, they can use Lotus Notes, they can use a spreadsheet, they can use Word or Excel or whatever."

[HR Senior Manager]

The above discussion illustrates the skills expected by each group of respondents. While educators and students more focus on IT skills expectation, practitioners are looking for other personal and learning skills.

6.7 Perceptions on coverage of IT skills in accounting degree programmes

This theme represented by the open categories of 'objectives of integration 'approach to integration' and 'IT skills integration experience'.

6.7.1 Objectives of integration

This open category is about respondents' viewpoint on the purposes of integrating IT into the accounting programme. Based on the interviews, the objectives of incorporating IT, either as educational technology, or as professional skills required were identified and grouped into four main categories as follows:

6.7.1.1 Reinforcing students' learning process

Students' understanding of conceptual accounting knowledge was a main focus for educators. Educators employed many approaches, such as lectures, textbook-based exercises and group discussion to enhance students' understanding of principles and concepts. Besides the regular methods, some educators believed that using IT applications in some areas can be more effective. Thus, in those cases, they integrated IT into the lesson to reinforce the learning process. For examples, @ Risk software was used to enhance students' understanding of some principles of capital budgeting, and Excel was used on many occasions, such as in budget preparation and statistical approach research.

> *"...the software helps to model that and helps provide the students with the understandings of how the risk and uncertainty can be modelled. And I think the students gain a lot from that. That they are using IT, they are using much more advanced IT applications, they would do or have done so far in their degree and they gain academic understanding from that as well."*
>
> [Accounting Educator B]

> *"Well! See on what we do at level 3, management accounting, do the conceptual; understanding there of the academic prominence on NPV, there is the conceptualisation there of the techniques, and the use of the IT reinforces how that conceptual technique can be discussed, analyzed, debated and created much more rigorous and more effective intellectual debate about the topic area. So, I take those as good practice."*
>
> [Accounting Educator B]

6.7.1.2 Creating a different learning environment

Another purpose of incorporating IT into learning and teaching is to diversify the learning environment in order to promote an enjoyable learning experience. The environment provides an opportunity for students to have hands-on experience in using IT applications and tools. Educators expected to build students' enthusiasm in different learning settings, to improve the learning process.

> *"... second year course management research (MR) which I developed about three years ago, erm the 1st year I did that course, students studied some statistics, erm like use of statistics in research. Basically I went through statistical methods in the classroom and the students did a number of written exercises and so on. Second year, students studied the statistics and data analysis through using the data analysis package on Excel. And so they were basically using the sort of analysis tool they might be using in practical research. They studied this in a computer lab, they had a computer-based assignment, and that worked much better than trying to teach them in the classroom in the more traditional mode."*
>
> [Accounting Educator R]

Many students found that the IT-based class environment was interesting and some of them showed commitment by attending the classes and completing the assignments given. However, some students felt that they did not see the importance or advantage of having IT lab-based classes. They put little effort into completing the assignments and some even did not turn up to the sessions. The students considered that some of the lab sessions were not important, since the material covered was not included in any assessments.

6.7.1.3 Developing one of the skills required by accounting profession

Most educators perceived that IT skills were very important skill for any career including accounting profession. However, some of them asked by whom and where should the skills be developed. Some were strongly convinced that employers were responsible and should train their employees in IT skills. On the other hand, there were a number of educators felt that it is time for higher education to equip students with IT skills to help them enter their profession. Thus, this group of educators initiated some IT skills integration, such as incorporating spreadsheet software with

analysis-content-typed coverage as well as using specific software, such as @Risk, while discussing the capital budgeting topic. These integration efforts aimed to develop IT skills, assumed to be one of the expected skills by employers.

> *"I think to make sure that the students, when they leave us, they are capable, one, know what is available in terms of accounting packages and so forth, and to support them in their work, but also how industry uses IT..."*
>
> [Accounting Educator D]

Some students had the same objective of having IT skills integrated in their degree courses, namely to prepare them for the assumed skill needs of employers. They were looking to obtain IT skills, which going to be used later in work place.

The above three main objectives of integrating IT in teaching and learning is covered in the following quote:

> *"To make it enjoyable, to help them in academic understanding and also to provide them with skills that they haven't developed erm so far. I would think the skills that they are developing, one of the, in my own perception, one of the main skills that the students could require once they move to an accounting profession would be knowledge of Excel, erm such a powerful package, erm but it is probably apart from Word Processing, it is probably one of the, I would accept it, one of the more common applications that students in accountancy profession ought to use. That's why the exercises that I bring in are Excel related, just in terms of what I think the students will be doing, and linking formulas. So, I think there is three aspects to that, what is my purpose behind it, is to make them enjoyable, is to make it academically relevant, and to provide them with one of the more important IT skills that I think they will need as part of their career."*
>
> [Accounting Educator B]

6.7.1.4 Time saving

Another objective of using IT in teaching is to save time. For example, a few educators conducted computer-based assessments for the benefit of saving time in the overall process of the assessment, starting from setting the test to evaluating the performance of students. They agreed that the integration process normally took

time, especially in the initial stage. However, once it was set up, time saving for the rest of the process was tremendous compared to handling and grading pen and paper-based test. Thus, educator was actually spent less time in the overall process.

Besides that, some educators conducted fewer classes, but in a larger IT-based lab, instead of having a number of small groups in a classroom-based environment. In doing that, they experienced time savings, in terms of reduced contact time with students.

> *"...when I integrated teaching using Excel, one thing was I had fewer classes, because I had more students in each class, I said there's no point having [teaching the same materials to several classes with a very small number of students], you can get 30 of students in the computing room and deal with them all at once, basically they are working through a set of task and I'm there as a consultant and going around helping them and telling things to get on with, rather than 2 classes of 18 to 20 and doing the same thing there, so cutting the number of classes for the same benefit for the students, this is one thing reduces my work.*
>
> [Accounting Educator R]

Furthermore, they were better able to manage their time, through the discussion board, students could pose similar questions that could be conveniently dealt with a more enjoyable way.

> *"Last year I did the management research course, erm, my experience that the students did the lengthy statistics assignment that they had, had a lot of questions and I found that I was repeating answers over and over again. So last year, I said I'm not going to see anybody individually, don't come and knock on my door, don't send me e-mails, and set the discussion board, and if you have any query, put it upon the discussion, and look at this once per day and give you replies, and the fact is that there were over 150 queries and I was able to reply to those queries, it meant I was doing it when it suited me rather than having lots of interruptions and dealing with things ad hoc and it also meant that my comments were in the public domain so it was very useful in the case of an individual student having specific knowledge and another student might not. So, this sort of thing, you know, that they might not reduce*

the amount of work; at least it allows me to do things when I want or when students wanted."

[Accounting Educator R]

Another time saving is from the use of computer-based assessment systems, which save a substantial amount of time in the marking stage.

"And I think that colleagues who use the electronic assessment method, they, well! They might have to put in an additional amount of investment in terms of setting the questions, but then if the computer marks everything and does the grades and feedback for the students that saves a lot of work as well. And so in using things like blackboard as an alternative to things that perhaps might be more time consuming a few years ago. And they may be a basic or low level thing, but if they help to control, my own work is under control, and I think that's good."

[Accounting Educator R]

6.7.2 Approach to integration

This category represents opinions on various approaches adopted or with potential to be adopted in integrating IT skills in accounting education. The following issues were discussed:

6.7.2.1 IT in accounting units versus accounting related IT units

The question arose is to what unit IT skills should be developed in. There were various opinions on how IT skills should be developed. Some respondents preferred skills to be developed in existing accounting units, while some preferred to develop skills in its own, separate units.

6.7.2.1.1 IT in accounting units

Some educators argued for IT skills development in existing accounting units for certain reasons. First, they emphasised the course title itself, which is 'Accounting Degree programme', not IT or computer science degree programme. As an accounting programme, the whole programme should focus on the development of accounting-related understanding and skills rather than IT skills alone, which should be more appropriated to develop in IT or computer science-related programmes. Thus, they did not favour having stand alone units covering IT-related skills to avoid programme overloaded or a overemphasis on non-accounting-related units to the

detriment of accounting content. Some students had a similar view of not learning IT skills in a separate unit, since their choice was to learn accounting, not IT. They preferred to allocate time to learning IT skills, relevant to the course elsewhere. This was matched with the educators' emphasis, which was also on the use of IT or the development of IT skills as an approach to help students understand accounting concepts rather than on learning IT as a skill in itself. This approach would contribute to knowledge and skills for both accounting and IT.

> *"I think we need to recognize why are we using IT,* and *making use of IT not for the, just for the sake of saying we are in the IT lab, but to make it applicable to the accounting side of things and again, get the balance right. We get the balance right, then we instil the concepts through using IT as well. We don't have 10% of the concepts,* and *90% play around with the computer, but we get the balance right, so we have the learning outcome to assure as far as possible that we focus on the accounting sort of things. But I still use the IT, then we are able to totally concentrate on what the objective is, and the objective is to understand ratios, the objective is to understand depreciation,* and *it is a means to an end, it is using IT as a means to understand an accounting concept.* And *get the balance right, and then we should get effective learning for the students in both sets in terms of IT skills* and *in terms of accounting concepts."*
>
> [Accounting Educator B]

Secondly, they perceived that having IT in the present accounting units would help students to relate the uses and functions of IT in the accounting field rather than seeing it as a separate discipline. Some students had a similar opinion, preferring IT skills to be developed in current accounting units, so that they could see the usefulness of it in understanding and performing some accounting tasks. It was evident that a majority of students did not appreciate the knowledge and skills learned in IT and IS unit, when offered as a stand-alone unit. Most of them found the unit was not relevant at all to them as accounting students. The educator who taught the unit admitted that the unit was quite general, since it was offered to students from all disciplines. However, the educator argued that accounting students should be able to appreciate some of the content and skills covered, since they were commonly related to any organisational tasks (including accountancy). For example, the lab session on creating a database using Microsoft Access was perceived to teach a basic IT skill required by all, including accounting students, who will later use

databases. Thus, it is important for them to know the basic concepts behind its creation to be able to appreciate the importance and usefulness of databases.

Another example is the coverage on types of IS available and used in organisations and how they can be developed, which were also considered as appropriate for all, including accounting students, since some of the IS, such as transaction processing systems, is a type of system within integrated IS used to generate accounting information. The conceptual knowledge and understanding on how IS could be developed is also significant. It makes students appreciate the development process within the systems and gives them some background to apply later when they are involved with any IS development, particularly in financial and costing related matters. However, most of the accounting students could not see the usefulness of the course for them as accounting students. Thus, the students did not favour as a single, general or separate unit.

Third, educators viewed IT skills as not being feasible to develop in accounting units as the structure of the current accounting programme is already packed. Some third year students also acknowledged the issue of the, the tight programme structure. However, they felt that there were still possibilities to integrate skills, including using accounting packages in the first and second year units. They argued for a reduction in pen and paper -based exercises, to be replaced with introduction of using any accounting packages, which were more relevant to real practice. This was also agreed by some first year students, who felt that their timetable was not so packed, and that they still had room for additional classes for IT skills development.

6.7.2.1.2 Accounting related IT units

Some argued for the integration of IT skills through a stand-alone unit. Same as above, they referred to IT skills, which were within the accounting context. For example, an IT unit could be introduced that covers Excel for financial modelling or an accounting package such as SAGE instead of incorporating those in the core units of accounting. Some educators saw the appropriateness of having IT skills in separate own units, because of the tight content of the accounting unit itself. Educators expressed their feelings on the substantial amount of subject related matters to be covered in accounting units within limited time constraints. It was a priority for them to cover accounting parts rather than IT skills. Thus, they preferred the IT skills to be developed in a separate unit to enable them to focus on accounting-related materials.

It is still the content is important, knowing how to do thing. So it [IT] has its place, but I think care has to be taken. And I'm not sure the degree to which IT skills should be embedded within the accounting unit. Let's say that you are doing Financial Accounting, is there a package used in the unit? Or a separate course for financial package? The package that accountant will use. I think for a pedagogical reason, it is separate activities.

[Accounting Educator Y]

Some students had a similar opinion, and argued for separate accounting-related IT units that would allow sufficient amount of time to learn and develop IT skills.

Some educators justified this issue in terms of cost. They perceived that it was not worth to spend significant amounts of money to acquire software or other related IT applications or systems that would only be used for a few hours of teaching in any existing accounting units. They felt that the investment would be justified if the software or related systems could be thoroughly used in one unit throughout an academic term or extended to use in other units.

Some respondents were more flexible and viewed that IT skills could be developed through existing accounting units or with the introduction of new separate accounting-related IT units, depending on practicality, since both ways have advantages and disadvantages as discussed above.

"My view would be we should integrate it [IT] within existing courses more rather than teaching in a separate subject. But I got a feeling we ought to be teaching it in a separate subject as well, because students have a basic knowledge about what are required in terms of IT for accountants and then integrate it into their courses. Again, one or two people do that, through case study, and [Educator B] seems the example again. But I'm not sure. It's a bit too ad hoc at the moment. It needs to be thought about more systematically and strategically it might be."

[Accounting Educator D]

6.7.2.2 Educational tools versus IT skill development

Some educators expected to develop IT skills through using IT as an educational tool and some believed in developing skills through other initiatives.

6.7.2.2.1 Educational tools

Many educators emphasised using IT as an educational tool, giving examples of using Blackboard, using presentation software in delivering lectures and computer-based tutorial packages on particular accounting subjects.

> *"Thinking about IT, we are looking for packages now, from EQL, they are very useful at start, for accounting 1 and I am evaluating the use of EQL for financial management and for international financial statement. And may use in those courses."*
>
> [Accounting Educator T]

By adopting IT as an educational tool, they believed that students would gain familiarity with IT-related material, for example using the Internet to access Blackboard.

6.7.2.2.2 IT skill development

Some educators extended the practice to directly develop the skills, for example by incorporating software that were more related to accounting and finance uses such as Excel and @Risk software. Besides incorporating the packages to develop the skills and to enforce the learning process, the educators also expected students to have some idea about available packages used in the real accounting field as well as having skills in using the software. Moreover, educators also expected students to develop skills in using IT-based research tools by encouraging the use of the Internet in searching for information and using online library databases.

6.7.2.3 Formal versus informal integration

6.7.2.3.1 Formal integration

Some educators formally designed their teaching approaches in ways that enable them to encourage students to use software, such as Excel and PowerPoint. One way of doing that was through formal lab sessions in which students work on computer-based assignments guided by written instructions in handouts. The

students work at their own pace and with opportunities to ask the tutor whenever they have problems. The students are also allowed to discuss with their friends. In this case, the educator plays the role of demonstrator as well as facilitator. Some students appreciated the skills developed through this approach.

> *"I think I developed my Excel skills in university. I learned a lot there. We were given a problem to solve using Excel. And the instructions on how to solve it were written on the handout. Just follow it step by step. Finally you know how to do it, use formulae, and do simple analysis. Yes! I learned a lot from that."*
>
> [Alumni 2002_L]

However, there were some who did not see it as a productive way of developing the skills. The students felt lost and the skills aimed to develop were not retained, since they merely followed instructions without trying to understand what they were doing.

> *"...all stuff they taught us in Excel now, I couldn't tell you how to do any of it now. Just a case of having a load of sheets telling you how and then a question came along to do with it, you got your sheet out, but I could not remember how to do half of the stuff that they taught us in there. A lot of it seemed like a waste of time."*
>
> [Accounting Student Y3_J]

Another way was by requiring the students to do assignments using the software. This approach did not provide formal teaching on using the software but left the students to learn the skills by themselves. In both ways, educators believed they were successfully developing skills, based on the output produced by students. Another skill, which appeared to be formally integrated in the taught units, was the skill in using the Internet for research purposes. Some of the educators gave reading assignments and references, which required students to access them through the Internet. There was also one educator who required students to send assignments by e-mail to ensure that students knew how to use it and to encourage them to use it. The above IT skills were observed to be the only skills formally developed in the programme and concentrated only in a few units.

6.7.2.3.2 Informal integration

Most educators expected students to develop or improve IT skills without the educators having to formally integrate the skills in the taught units. Educators

assumed that students knew what IT skills were required or relevant for them and would take their own initiatives to develop them. For example, all educators expected students to use the Internet as a research tool, as well as other research facilities, such as online library databases. The same assumption applied to using Word and Excel packages, with educators expecting the students to use them wherever appropriate. One reason of doing that was that educators had a strong belief that the students already possessed some skills such in word processing, basic Excel, the Internet and e-mail. Thus, they expected and assumed students to learn and use them in their coursework without having formally taught or clearly given instructions.

> *"As you know, I teach first year financial accounting and in the process of that they will use IT; they are using IT, they are using Blackboard as a resource, which is not skills. Is it? But being able to access it is a skill. I would expect them to use the library and library catalogue, where you can gain IT skills and they have access to tutorial packages, which is again not IT skills, but they are using IT for the purpose of learning accounting. And I expect them to use e-mail. All of which is probably one just taken for granted these days, while 10 years ago it was new but now they probably take for granted."*
>
> [Accounting Educator E]

> *"In tax policy, which I teach in the third year, I would expect students to use library skills, looks [for articles in] databases and use the Internet. So they are practicing* and *developing that there but they not being taught that. They are using it and developing it. Erm the students do use Excel or a spreadsheet package on occasions, so it is not integrated to the course, definitely something much easier to do and I expect them to use word processing but that is out of the issue, they will do that."*
>
> [Accounting Educator P]

From students' point of views, third year students in particular were willing to learn and develop IT skills through self-learning as long as relevant facilities and software are provided. Besides that, there are some contexts where they were able to use the software. They saw that this approach would give them more freedom and gave them ample time and opportunities to discover and use the software.

> *"I'm sure we have to learn it ourselves, I think, like Management Research. We had to learn PowerPoint on our own and I think that was the best thing to do*

because you just got to fiddle with it and you didn't have anybody watching over your shoulder, writing how many mistakes there were."

[Accounting Student Y3_V]

6.7.2.4 Assessment

There were different opinions on whether the IT skills developed should be included as a part of evaluation and assessment process. Some educators considered it as a part of assessment, since they viewed it as a fair practice to assess the work assigned to students, including IT-related work. Educators assessed and evaluated it in different ways. Some of them required students to complete and submit the work to be evaluated as part of progressive assessment. There was also one educator who gave written assessment to evaluate students' conceptual understanding on the application part of the software in a final examination. However, from the data, none of the integration experiences assessed the hands-on ability of the students in using the software.

Some educators did not assess IT skills development, because they viewed and treated IT-related work as a normal exercise to enhance students' understanding without giving a formal assessment of it. Many third year students preferred to learn the skills in a more flexible manner and not include the work in the assessment. However, they agreed that assessment could be somehow an enforcement tool to encourage students to develop their skills, especially in the early years of study. On the other hand, some first year students preferred to develop their IT skills through a compulsory taught course and with assessment.

Some educators found students responded well to IT initiatives when work was assessed continuously, for example through their reports submitted and PowerPoint presentations. However, in the case where assessment was evaluated on students' understanding on organisational used of IT applications through written-typed questions in the final exam, the responses of students varied from very good to not very good at all. In general, educators found it was predominantly not very good. The same result occurred with non-assessed IT-based activities. Responses from students were very rare and sometimes none of the students participated or attempted to complete, for example, the lab-based assignments. Educators found only a few students who were really interested or showed commitment towards attending lab sessions and completing assignments. Thus, assessment could influence student participation in IT-related activities, but not always.

Educators and students as well viewed that interest and maturity of students were influencing factors in initiatives to develop IT skills. Students were willing to learn whatever benefited them.

"I won't even mind doing an extra class or something. I understand there are constraints on the courses, but yeah, definitely use it."

[Accounting Student Y3_P]

"...Possibly, because we were meant to have a course that is meant to equip us for a career then it should be, personally, I'm not sure that I would want a complete unit and I would not really want to be tested on it, but just something that would help me prepare for a job"

[Accounting Student Y3_V]

6.7.3 IT skills integration experience

This category is about initiatives made by educators to integrate IT in teaching. The initiative could be to use IT as a tool for teaching or using IT to develop skills. It could also do so directly or indirectly. Some educators indicated some alternatives to IT skills integration in their units and believed it helped students develop some basic IT skills by the end of the programme.

"We provide them with general Word processing skills because they have used Word for their assignments"

[Accounting Educator B]

"I would think all students are very familiar with using Word. At the end, as I can share, for that thesis, nearly everybody presented their work using [a] computer package."

[Accounting Educator T]

The BSc Accounting and Finance course offered by School of Management required students to study twenty-four units (eight units each year). Nineteen units were compulsory, consisting of eight accounting and finance-related units, four management-related units, two units for economics, law and a dissertation, and one unit on an IT-related subject. The remaining five were optional units, chosen from list made up of three accounting-related units, one unit on International banking, futures and options, risk management and marketing. The following session included IT skills

integration in the programme according to the taught units, which showed some integration initiatives.

6.7.3.1 Financial and Accounting Units

There was no formal IT skills integration in financial accounting units, apart from the use of Blackboard. Blackboard was intensively used in financial accounting units, especially in years one and two. Students could find course materials for the units, including suggested solutions for class discussion, quizzes and sample examination questions. In the financial accounting unit for year three, students were introduced to the use of a discussion board. There were also a few sessions of student presentations in-group, in which most used PowerPoint software. Students were also observed to use the Internet through their list of references, which most of them had retrieved from websites. In the financial unit in year one, students were also provided with a computer tuition package, which could be accessed through computer workstations at university or in residential halls. The use of the package was optional, totally depending on the students. E-mail was also used in the units as a medium of communication. Students enrolled in financial accounting one were frequently contacted through e-mail about any changes or announcements and reminders about particular issues related to the unit. Although there was no formal IT skills integration in the use of a word processor or Excel, all educators expected students to take their own initiative to use them wherever appropriate.

There was more formal IT skills integration in management accounting units. For example, in the management accounting for the first year, students had classes in IT-based labs for forty five minutes each week for three consecutive weeks. In the first lab session, students were given a problem, involving preparation of a simple cash flow statement using Excel. In addition, students were also given a few questions related to the cash flow, in which they had to use the 'what if' function. There was no step-by-step tuition on how to use Excel to prepare statements, but the students had to call up their existing knowledge or learn how to insert formulae on a given template, based on the situation provided. This was considered as a basic skill level of Excel.

In the second and third sessions students were working on developing an NPV model for capital investment appraisal. Besides providing a case where students learn to use some built-in functions in Excel, such as NPV and IRR formula functions, students were also exposed to the use of a macro function and to plotting a graph.

There was no demonstration or step-by-step guideline on using Excel to develop the model. However, a sample illustration of use of a macro was provided through Blackboard. Students were given the opportunity to explore Excel on their own with the help of the class tutor. There was no detailed assessment of the use of Excel, but students were tested on their knowledge and understanding of IT applications in accounting issues, the use of Excel in capital budgeting being one of the possible applications.

The use of Excel then extended to management accounting in year three, where students were exposed to the use of Excel Solver to do simplex linear programming. Students worked in the labs after having been taught theory in lectures. Students were also given some revision on the topic through Blackboard. It was different from the previous approach used in developing skills in Excel, where students tried on their own from the beginning and could ask the tutor if they came across any problems. In this session, the tutor demonstrated and guided them in solving the problem up to a certain point. The students were then asked to complete the exercise on their own. To encourage the students to complete it, they were offered a prize. The skill developed was considered as an advanced skill of Excel.

Other IT skills integration occurred in the third year of management accounting, where students were exposed to the use of the financial software called @Risk. Students were taught to use the @Risk software to develop financial modelling, which helped to simulate the risks related to using NPV as a criterion in investment evaluation. This was considered as an advanced skill, related to the use of specific financial software to model risks and uncertainty, in decision-making and in investment appraisal.

Besides the above skills development, students' skills in using PowerPoint were also developed or enhanced through integration of the skill in the year three management accounting unit. There was no formal teaching of the skills in IT-based labs. However, students were supposed to use PowerPoint as the medium for their class presentation. Thus, students had a context in which to use their existing knowledge or skills in PowerPoint or to learn and develop the skills on their own if they do not have it yet. The students' effort in using the software was also graded.

All of the above integration experiences attempted to develop the IT skills required by employers. The educators believed that Excel was common software used in the working environment. Integration aimed to enhance students' theoretical and

practical understanding of the availability and applicability of IT to management accounting issues. The integration believed to be an example of good practice of IT integration. Last but not least, the inclusion of IT in the unit created a different learning environment for the students, and made the learning process more enjoyable.

There was no indication of IT skills integration in the remaining financial and accounting related units, which were Financial Management and Portfolio Theory, and Financial Markets units, as well as optional financial and accounting units, Tax, Corporate Governance and Auditing. The Tax unit did involve some use of the Internet (accessing relevant websites), but the rest did not involve IT skills integration. The educators involved had no intention to integrate IT in the units, because of the time constraints and the lack of physical IT-based facilities. Furthermore, the educators wondered how IT could help teaching and learning processes in the units, even if the teacher of Portfolio Theory and Financial Markets made convenient use of IT packages such as Excel for his own purposes.

6.7.3.2 Management units

There were four management related units in the programme: Introduction to Management, Management Analysis, Organisation and Management and Management Research. There was no direct integration of IT skills in the Introduction to Management and Organisation and Management units, apart from a multiple choice computer-based test in Introduction to Management. Indirectly, students were expected to have or to develop skills in using presentation software in preparing their group presentation project. Besides this, the students were expected to exercise their skill in using a word processor when preparing individual written reports, which were included in assessment.

Direct IT skills integration occurred in Management Analysis. Using a spreadsheet tool for quantitative analysis was a key skill targeted in the unit. Computer laboratory sessions were arranged to demonstrate the use of spreadsheets in quantitative analysis, to support problem solving and decision-making processes in management.

Skills in using a spreadsheet package for quantitative analysis were also directly integrated in the Management Research unit. In the unit, students learned and used the built-in functions in Excel to analyse statistical data in computer-based labs. In addition, students' understanding and abilities were enhanced through coursework assignment preparation. Besides this, students were also exposed to using

computerized databases in searching the literature and retrieving relevant data from computerised databases.

> *"...students studied the statistics and data analysis through using the data analysis package on Excel. And so they were basically using sort of the analysis tool they might be using in the practical research. They studied this in a computer lab, they had a computer-based assignment, and that worked much better than trying to teach them in the classroom in the more traditional mode. So that is the example of how IT skills have been more intensively developed because students needed to erm have a certain amount of familiarity with Excel, a spreadsheet package. And what I found was there is quite a variation in the students. They were really good. They obviously had used it before very very extensively, others were less confident. And then, that's one aspect."*
>
> [Accounting Educator R]

Other IT skills integration in Management Research unit aimed to develop students' ability in using the Internet for research purposes. It was directly integrated through a coursework assignment, where students were required to search for potential references available on a website that was relevant to research in management area. Students were also working on a word processor to write a review of the selected website. Students' ability to use e-mail was also encouraged, as they were asked to submit their reviews through e-mail. Although there was no demonstration about using the Internet, a word processor or e-mail, the context provided led the students to use and enhance their skills in using the applications in more professional ways.

> *"Another aspect on that course, I wanted to encourage students to use the Internet for research purposes. So I set an assignment where they have to identify erm a website that could be useful for Management researchers, very very open ended and they have to submit a brief review of that to me using e-mail, so the fact was there was no paper involved in that. And again this will encourage student' IT skills in using Internet for research purposes."*
>
> [Accounting Educator R]

These were among the IT skills targeted to develop as key skills in the Management Research unit as stated in its unit course outline.

6.7.3.3 The IT and IS Unit

This unit was a general unit, taken by all students in School of Management, regardless of their designated degree. Among the content covered was general knowledge of various IS and IT used in organisations, including e-business, business intelligence and e-commerce, IT infrastructure and IS development methodologies. In addition, students were taught the roles of databases and database management systems in organisations. Besides the exposure on conceptual understanding above, students were also trained in IT-based labs to create and manage databases using Microsoft Access. There was no assessment on hands-on use of Access. Other items in this unit were the use of Blackboard and computer-based tests on multiple choice-typed questions. It was stated in the course outline that IT skills were one of the key skills targeted to develop in the unit. This was the only IT-related unit introduced in the current structure of the accounting degree programme in School of Management.

Outside the clear examples of IT skills integration efforts in some of the units in the current structure of the accounting degree programme, there was no indication of IT skills integration in the remaining units, include the law and economics units. Some students claimed that there was no further IT skills development in other units other than basic, such as word processing and using the Internet for information searches and research purposes, including completing the dissertation.

The above explanation elaborates the aims set by educators in including IT into their teaching, which are basically to develop skills required by employers and to enhance learning process as well as to take the benefits of using IT. Based on their experience integrating the skills, there are various approach of doing that, including hands-on exposure to IT package and indirect integration. The basic concept is to provide context for the students to use IT and develop the skills.

6.8 Factors influencing development process

This theme covers the open categories of 'driving factors', 'determinant factors', 'motivational factors' and 'external influences'.

6.8.1 Driving factors

This category is about factors that could strongly influence integration to take place or act as a catalyst for change. Many educators believed that catalyst or champion played a big role to stimulate the process of integrating IT into the programme. They viewed the catalyst could be represented by an academia among the academia within a particular school or a business or/and management school among the universities. The catalyst could set an example of IT integration and could also offer some supports on knowledge and skills to others.

Skilled educators interested in integrating IT into teaching and developing IT skills into students could act as a catalyst, especially unit coordinators. They have more control over what and how the units should be taught. Since the final says were depended to unit coordinators, their willingness to integrate IT becomes an important driving factor as the following quotes illustrate:

> *"I think that be a tremendous skill for the students to learn about, erm but as I mentioned earlier, it's for the unit coordinator to integrate that particular IT skill into their unit. And as the Director of the Accounting and Finance to react is, you could argue, well! You know, perhaps should be more forceful and say you ought to be put in there. But, it's not for me to dictate what goes into the financial accounting syllabus."*
>
> [Accounting Educator B]

> *"Erm it does come down to the motivation of the individual unit coordinator and the willingness of that person to integrate it."*
>
> [Accounting Educator B]

6.8.2 Determinant factors

Many educators considered IT effectiveness as determinant factor for them to use it in teaching and to develop students' skill in it. They viewed that it should be incorporated wherever possible and efficient compared with other teaching tools and approaches.

"We as a group of teachers have decided that this is important, that we teach this, and this is a convenient place to put it, because it is to make both developing and also teaching some accounting concept at the same time."

[Accounting Educator N]

"And if the IT packages more effectively deliver the content and show more than me standing there and talking about it, then that's the role for the IT."

[Accounting Educator B]

For some educators, the availability of IT applications to be used was not enough, but they give a tremendous impact on the learning and teaching process, enhancing students' understanding, adding value to academic content as well as learning experience of students.

"This is why with the '@Risk' software, erm, we debate it for maybe one session, for them to go into the accounting lab and use it, into the IT lab and use it because it serves a better purpose than me demonstrating it on the notepad projector or through the computer. Students' hands-on experience will gain a lot more from that. So, it used to reinforce [learning process]."

[Accounting Educator B]

6.8.3 Motivational factors

This category is about factors that could encourage educators to incorporate IT into their teaching. Among the factors are:

6.8.3.1 Personal interest/motivation

Personal interest is perceived as a primary motivating factor leading educators to put efforts into incorporating IT into their teaching. Some educators observed that those actively integrating IT in their teaching are highly motivated and interested in IT. It was also agreed by some educators integrating IT into teaching that they did so because of their interest as well as their belief in the benefits offered by IT. Their interest strongly encouraged them to integrate IT to the extent that they did not see any difficulty in doing that. They were convinced that by having personal interest, the rest of the problem would be taken care of.

"So, I don't really see any huge barriers or problems in me personally integrating IT, because I think it comes from their motivation within themselves."

[Accounting Educator R]

"I enjoy it. I think that comes up the most of all. I think if you got an interest in IT, it something which you enjoy doing, erm then, that's undoubtedly one of the primary motivating factors."

[Accounting Educator B]

6.8.3.2 An exciting and enjoyable teaching and learning environment

Ability in IT helps create an exciting and enjoyable teaching and learning environment facilitated by the educators' interest. Educators were enthusiastic in making use of IT more so than in teaching in the traditional teaching approach.

"Erm, as an academic teacher of the subject that I'm enthusiastic about, I like to find ways in which IT can make the subject more exciting. Erm, so that's probably one of the major driving factors for me. I like going into an IT lab, I like using software packages, I like what it does, I think it provides students with an insight that they wouldn't see in the class-based exercises. Erm, so that's probably, maybe the major motivating factor for me; I personally enjoy it and *I think it makes my teaching of the subject is much more exciting as well. So, it gives the students something."*

[Accounting Educator B]

6.8.3.3 Time saving

The benefit realised of time saving is another factor that encourages educators to use IT in teaching. Some educators convinced that in spite of the time spent in the initial process, arranging and setting up the labs, developing the materials and so on, it paid off when they could save time later, once those initial steps were done, for example, time saving in the evaluation process using computer-based assessment.

Another obvious time saving realised by some educators is being able to arrange fewer group tutorials using IT-based labs compared with regular classroom activities. In this condition, more students can join groups, reducing teaching workload of same

materials to all students. For the educators, this approach helped to manage resources when teaching a large number of students.

Another benefit that encourages educators to use IT in teaching was in terms of time management. Besides reducing the teaching workload, educators could also manage to entertain students at their convenient time. For example, some educators preferred to use the online discussion board to monitor issues raised by students. Besides benefiting students in terms of allowing them to raise issues at any time, educators felt it helps them to manage their consultation times. One way is through allowing the educators to choose the time convenient for them to read and consult the students. Another way is through reducing time spent dealing with common problems raised by different students at different time, which can be solved simultaneously.

Educators were concerned that the advantage was to them rather than to the students, since they were uncertain about IT skills development in students. On the other hand, some educators believed that it still gave benefits to students in terms of gaining exposure to an IT-based working environment. Furthermore, in the use of computer-based assessment, students would receive quicker feedback. In discussion board, all students would benefit from discussion of common issues. Some students also realised the benefit of discussion board, even if they had not directly posted the issue.

6.8.4 Support

This category is about the support available or required for a successful IT skills integration process. The support could be skill-based support, physical IT support as well as motivational support. There were many human-based support available and necessary, mainly for technical assistance or / and knowledge support.

Some educators found that the learning and teaching coordinator played an important role in encouraging educators to make innovations and improve their teaching, including the integration of IT into their teaching. The learning and teaching coordinator helped educators to identify the skills needed to improve their teaching. She also managed to arrange a workshop, discussion and training on some skills required by educators. However, it was found that not all educators attended the activities and the attendees were normally those same persons with high interest in making innovations in their teaching practice.

Another support group was the Centre of Learning and Teaching (CLT). They provided training and a workshop on the skills required by academic staff in the university including tutors and postgraduates. The training ranged from self-development in personal skills, such as pronunciation skills and presentation skills, to skills in handling small group discussion and in using IT in teaching. Some educators, including those from School of Engineering Science and School of Education found that the CLT was very helpful in giving them advice, skills and technical support in initiatives to integrate IT. For example, the centre provided training in the use of Blackboard and helped those who wanted to have computer-based assessment and e-learning. However, not many educators from School of Management came for advice on using IT in education, apart from a few who had come to seek advice on conducting computer-based assessment.

Another IT-based service provider was the Information Systems Services (ISS), which provides computing and IT facilities for all staff as well as students at the University. They gave advice and support on IT-related issues, including installing new devices, distributing software, accessing IT facilities from home, creating e-mail accounts as well as providing lecture theatres and labs. Besides giving on-campus services, they also provided off-campus computing services, such as at the hall of residence. Some educators, including those from School of Engineering Science and School of Education found ISS to be very helpful in providing computing facilities. For example, some educators managed to arrange labs for class tutorials and computer-based tests with use of requested software. During computer-based test sessions, staffs were also available for any technical support needed. However, some educators experienced difficulties in getting impromptu technical help, for example when they faced problem with computer systems used during lectures.

They also felt that IT-based physical support was inadequate; for example many lecture theatres still did not have computing facilities, such as computer systems, Internet connection or LCD projector. Some students also expressed their dissatisfaction with the availability of working workstations; many were malfunctioning. As a result, they had to share with friends, which sometimes limited their chance to try using the computer on their own. However, some of the classes in the IT labs were arranged in such a way that two or more students shared a workstation to accommodate all the students in the class. Some students did not favour sharing a workstation, as it interfered with their learning process.

"There was plenty of support within the school, plenty of support within the university. We have a [Miss X], our learning and teaching coordinator, who attends various conferences, and sends us various e-mails about various things that are happening. We have a centre of learning and teaching which can advise us and provide various courses on integrating IT, and we have evidence of good practice within our school from other staff that have used the discussion board, that have used computer-assisted learning, that have used bits and pieces where things have worked. But courses run by the Centre of Teaching and Learning, or we have a course run internally within the school, for integrating IT in the e-learning context, then the people attend are the same people. It is the same group of interested people that attend, and it is up to these other people that are traditionally uninterested to bring them in also. So there is a plenty of support, but there is not enough enthusiasm or motivation all the time for those people that aren't in the circle to want to come in. erm so I don't think it is necessarily a problem of lack of support, lack of opportunity within the school, I think it works both ways. There is the support, there is opportunity within the school in the university, but you got to have a member of staff willing to take part, take advantage of that support."

[Accounting Educator B]

Another element of support was person acting as catalysts. Some educators viewed that catalysts played a big role in setting an example to others. Besides showing good practice in IT skills integration in teaching, they could offer help in terms of knowledge and skill as well as any related advice to others. Besides this, they could initiate integration processes by conducting discussion on related issues, informing other colleagues on the availability of suitable applications to be employed in relevant areas and updating on what other colleagues, schools or universities were doing. In other words, support and collaborative work among colleagues was very important. Some educators found that, at that moment, there were lacked of the personnel who could set a leadership example in IT skills integration.

"Well, that helps, because like I said, lots of these things need somebody to champion them, to push them and somebody who has specific interest and capability and that helps [indeed]. Not the only way though, [laugh] but it can be a great help."

[Accounting Educator R]

The above support was in terms of general IT facilities, knowledge and advice. Another support needed was in terms of expertise related to subject areas, which in this case was accounting and IT applications. At that moment, some classes, including IT-based classes, were conducted by temporary tutors. Some educators were sceptical about the IT skills and knowledge of the temporary tutor. Some of them were struggling to understand the applications while at the same time had to convey them to students. This condition did not give optimum benefits to the learning process of students. Thus, instead of relying on temporary staff, more permanent staff with skills in both areas was needed. This would help to reduce the time spent training tutors as well as guaranteeing the smooth flow of tutoring. Since staff had knowledge and skills in both areas, they would be familiar with suitable accounting packages available on the market. With their expertise, they could also offer technical and knowledge support to students and other tutors or educators. This would overcome the problems occurring due to the lack of IT skills-based staff or non-accounting background staff, as occurred in that situation.

For example, one educator revealed some difficulties faced in obtaining applications and making them available for students, for example databases of financial data, as they had to go through many administrative staff to acquire the required software, who then communicated with ISS and the library.

Some educators found that support from employers was also important. The support could be in the form of technical and knowledge advice. It was important for higher institutions to keep up-to-date with changes in the industry. Thus, employers could give support in terms of updating nature and applications used in the area. They can also offer training to staff. Any form of incentive from employers to students as well as to educators was also considered as good to encourage IT skills integration in higher education degrees. There was a department in School of Management that hired somebody with an industrial background to teach particular units or parts of a unit. Similar practice had also been arranged in the accounting programme in the past, where former students came to share their experiences in various area of accountancy, such as tax, management accounting and auditing. However, it was abolished as educators viewed it as time consuming. Despite that, some educators thought it was good to give real exposure to students. Therefore, support from employers would be essential in collaborative work with educators.

Last but not least is the support from top management of the school. Some educators felt that commitment from top management was considered as an important kind of

support. They should show their commitments in terms of budget allocations for IT integration initiatives. Many educators expressed their concern about obtaining approval for the expenses required in the process, including purchase of relevant computer systems and applications. However, some educators expressed the support received in terms of cost to acquire the application. They experienced no problem in getting approval to acquire a new package to be used in their teaching. Some educators, including those from School of Education and School of Engineering Science, also viewed incentives, in the form of rewards and acknowledgement, as being good motivation in IT innovation in teaching.

6.8.5 External influences

This open category is about the external factors that influence IT skills development in accounting degree programmes. The term external refers to the source of the factors, which originated from outside of the school or beyond the control of the school. Five external factors were perceived to influence IT skills development in the programme. They were university policy, other universities' practices in IT skills integration, the perceived IT skills required by employers, quality assurance reviews and professional course accreditation. Details on how strong each factor influenced the school's accounting programmes in IT skills development are discussed in section 8.5.1.1 of Chapter 8.

This section discussed on the factors perceived to influence educators in integrating IT into their teaching. The factors are basically related to individual educators such as educators' personal motivation, benefits of IT to enhance students' learning process, support factors such as physical, technical and knowledge support. University policy, employers' expectations and practices of other universities also appeared to be strong influential factors towards IT skills development. The subsection discuss on the issues emerged to give obstacle to the development process.

6.9 Issues facing development process

This theme covers the open categories of 'perceived barriers to IT skills integration' and 'problems of integration'.

6.9.1 Perceived barriers to IT skills integration

This category highlights issues raised by respondents, mostly educators, that appeared to prevent initiatives to integrate and develop IT skills into teaching. Among the issues were:

6.9.1.1 Tight syllabus structure

Most educators felt and that the syllabus was very tight and therefore prevented integration of IT skills in their teaching. The intensity of the syllabus ranges from intensive to very intensive. Almost all mentioned the very intensive content of the present syllabus, which has to be covered within a given time. The tight content in a restricted time leaves no room for any further IT-based content and activities, including IT skills development. The current content, which mainly focus on fundamental concepts of the subjects, were perceived as very important. As a result, it was difficult to discard any of them in favour of the time IT skills-based coverage and activities. Evidence from feedbacks by educators was as follows:

'...the current syllabus contains a very intensive content in which it is difficult to find space for lab sessions or to add some skills development in it."

[Accounting Educator E]

"The current syllabus is very intensive. There is no space in the current syllabus, it is packed enough to fit with other content of skill-based"

[Accounting Educator T]

"in terms of time that I got to teach the subject, I don't have any more time to cut in more content, so something will have to be dropped from the syllabus to make room for the IT- related activity to come in."

[Accounting Educator B]

6.9.1.2 The very academic and rapidly changing nature of the subject area

For educators, some of the subjects are very academic in nature. As a result, it was difficult for them to incorporate any IT skills or use any IT applications in the units. Besides being very academic in nature, some of the units were changing rapidly to keep pace with the changes in real practice, for example, those units containing material involved with accounting treatments and procedures, which are governed by certain accounting standards and codes. The educators involved with the unit have to

keep alert to changes and spend a substantial amount of time consistently updating their teaching materials. Consequently, the educators had no time to think about making other innovations in their teaching, including incorporating IT applications or developing IT skills for students. The educators felt that the remaining time for other obligations, held higher priority.

6.9.1.3 Staff interest and skills

Some educators and an administrator viewed staff interest and skills as among the major factors influencing initiatives to integrate IT applications and to develop IT skills in their teaching. Based on data related to interest and skills, in general, the educators could be grouped into four categories. The first category of educators had no interest and therefore no motivation to explore IT applications and to develop IT-related skills even for themselves. Some educators and the administrator realised that lack of interest in IT blocked path to self-development in the area. Many of them strongly argued that IT was not the only way of developing students' understanding, and IT innovation in teaching was not a priority for them. Furthermore, they did not bother to make efforts to search for suitable IT applications, to encourage students to use applications or to spend time to learn or use IT in their teaching. They were also not aware of what was available on the market. This type of educator had less enthusiasm to change and felt comfortable with existing practice. However, they still saw that it was important for modern students to have IT skills and they were not totally against innovation. A few educators fell into this category in the interviews.

> *"..But the main hindrance there would be, the member of staff teach, [name of member of staff] who you speak to, erm is not the most IT aware person. And he will quite happily admit that. And so it is very very unlikely that, that member of staff would want to integrate IT because he just didn't feel comfortable with it."*
>
> [Accounting Educator B]

> *"I'm telling [Accounting Educator B] that I'm not an active user of IT. I recognize it has a place, it has a lot of place but I'm not [keen to use it] in the same way I'm not [an active user of] mobile phone. I think there are bad sides mainly, so I use my mobile phone in emergency, where other people seem to use and see it completely as a necessity. I think that other people far more interested in IT than me. It is not my concern."*
>
> [Accounting Educator W]

"I suppose the only factor would be time in term of me gaining familiarity, and you know I'm more happily involved in research rather than teaching. Erm I think it is a steep learning curve for me to acquire more IT skills. So I have no desire to learn and use IT. Frankly you know, I'm quiet happy as I am. I don't bother anymore on IT skills."

[Accounting Educator W]

The second category was a group of educators who had some interest in IT but had a lack of skills and knowledge in the area. They were aware of the importance of IT skills for graduates and believed in the need to help graduates develop skills, while studying for their degree. Although they had some interest in developing IT skills for students, their lack of skills in using IT applications prevented them from incorporating that in their teaching. Some of them raised the issue of their lack of knowledge about what is suitable for use in taught units and what is available on the market. In addition, with time pressure on other tasks and syllabus completion, educators distanced themselves from IT applications, even to the point of not being concerned on word processed assignments, use of the Internet or online research. The initiative was solely on the side of the students. Many educators fell into this category.

The third category comprised educators who had familiarity with some IT applications but were not that interested in using them in teaching. In other words, they had skills and experience in using applications for other purposes but did not offer them to students. Some had tried to use them in teaching but did not follow up because of problems experienced in using them. Some of the drawbacks were administrative or to do with booking the labs, with large numbers of students, needing more lab sessions to cater for them all, and the non-availability of computer-based facilities in most lecture theatres. These negative experiences discouraged educators from incorporating IT into their teaching or from initiating IT skills-based activities for students.

One of the problems in using IT is, if you are using it, it's got to be well resources. You go there, walking to lecture theatre, you plug in your laptop, and be able to use it. That's got to be the infrastructure there, but it is not there. You go there to Math building, of all places, you look for it, and there is no provision to put a laptop. You know this [situation] is

across the board. My experience working with consultancy firm, if the laptop wouldn't work, firm told the guy, buy a new one. That's the sort of attitude, you know and it doesn't exist here. They are always sign of 'broken', and you try to call audio or video services huhh! Bitter experience here, that's why I don't use PowerPoint on the laptop, I use slides [OHP]. That is the issue .... I know the colleagues that do use laptop all the time, very successful in that, but I, very cynical about it, but [it is better] to university to provide adequate infrastructure.

[Accounting Educator Y]

In addition, they were also sceptical on how far IT could effectively help students in understanding the materials covered. A few educators fell into this category.

The last category consisted of educators who had a high interest in IT and had skills and experience in using some IT applications in teaching. Only a few fell into this group. Some educators considered that initiatives were substantial and significant in the effort of developing IT skills for accounting and finance graduates. They felt that this kind of educator played a role as a leader and motivator of others in initiating the effort. This group was expected to transfer knowledge, especially in identifying appropriate applications and helping other educators to develop skills. Some educators in this category had begun with short knowledge and skills in using applications, but with high interest in IT innovation. They were highly motivated to discover the relevant applications and found ways to effectively integrate them into their teaching. For them, interest in IT was a key influence on IT integration in teaching, since it would lead initiatives and overcome hurdles as practiced in School of Education and School of Engineering Science.

"In education in general, there are not many people who are not into ICT to help teaching. All of the teaching bases have got computer, projector and interactive whiteboard, for use them in classes. So, we tend to be fairly forward thinking except one or two that are not."

[Education Educator J]

"...we got about 60 academics in the school, I would say, there are probably only 3 or 4 that would have the real difficulty in it, who are not sufficiently IT literate to be able to put information on the Blackboard site or something like that. In fact probably I only think of three members of staffs out of that 60.

Yea...they continue to do the way they think they always have and erm not motivated to try them [laugh] and wrap new computer skills now. I don't think that has been a problem because there are so few involved."

[Engineering Educator M]

6.9.1.4 Identifying IT skills and the right application

Knowledge of what IT skills to develop is another factor influenced educators in the process of integrating IT skills into their teaching. Some educators expected students coming to university to have some common IT skills. On that assumption, many educators did not see the need to cover them again. Moreover, they had no idea of what IT skills were required by students or what should be developed in taught units. In addition, they also claimed that they were not clear on what IT skills were required by the profession or what should be developed in higher education. That stopped them from initiating IT skills integration in their teaching.

Many responses from educators exemplify this view as represented by the following quotation:

"...but I think the bottleneck that will prevent me from integrating more IT skills would be not knowing what further IT skills I could develop, secondly, not knowing what other IT applications are out there erm and learning about them and integrating them and thinking about a case study."

[Accounting Educator B]

There was a difference in the programme conducted in the School of Education and School of Engineering Science; the School of Engineering Science programme was regularly revised by the advisory board, which consisted of representatives from various organisations in the industry. The school of Education also kept up to date with the skills required by employers, since practical training for their students was considered to be a major part of their programme. Thus, they had a close relationship with employers and students were familiar with employers' requirements.

6.9.1.5 Time pressure to complete syllabus

Time pressure is another hurdle to educators from incorporating IT skills in their teaching. Time is crucial and puts pressure on educators to spend it wisely. Pressure is on to cover all the content of the syllabus. Some units were arranged in such a way that they were taught by a group of educators. Each educator taught a selected part of the syllabus and conducted lectures or classes within a specific time period. In such a situation, educators who had no interest in IT just proceeded without any consideration for IT skills integration. However, in the case of those educators who were interested in integrating IT applications and developing IT-related skills, the limited time was really a pressure for them to do that. They had to plan carefully and fairly distribute the time between covering conceptual background underpinning of the topics and using IT applications, as well as developing IT skills relevant to the subject matter. Furthermore, they had to justify whether the acquisition of the package was worth its usage in the time constraint. This issue emerged from the feedbacks as exemplify below:

> *"...And the reason for that is in terms of what I'm teaching and how much time I got to teach it. In the 3 weeks that I teach in first year, every week has got an IT class. Of all the sessions that I teach in my third year, I don't have the time to spend more time in the IT lab. I go into the lab, I think I provide 2 sessions, in the 3rd year, one for Excel Solver and one for '@Risk'. But I think that I teach things like ABC and the implementation of ABC, so, the implementation issue might not be IT relevant. But balanced scorecard, I'm sure there must be some software that develops thinking on the balanced scorecard. So we could integrate that skill. We don't because I have an hour and a half lecture and I don't have any other classes, the classes are the students do presentations, so it would be very difficult to teach more in the windows that I have got to teach, and moving into the IT labs, right now, I want to teach this subject of the balanced scorecard, I got to go thru, ,all the arguments, the criticism, etc. I can do that in my lecture slot, but I can't do that and demonstrate an IT package for another hour. And so that has to go, unfortunately, it does come down to what we can effectively deliver in the time that we got."*
>
> [Accounting Education B]

Time pressure issue was not only relevant in the units taught by more than one educator as discussed above. There were educators who had complete control of the taught who raised the similar issue of time pressure to complete the outlined

syllabus. In this situation, most educators normally choose to give priority to understanding conceptual coverage rather than to explore other skill-based approach, including IT-related activity.

From students' point of views, they felt that their timetables in the first and third years were quite loose. Most of them had gaps between classes and felt that slots could be used for IT-based development activities. In terms of units, some students viewed that some units in the first and second years, including financial accounting and auditing still had room for additional IT skills development.

Time pressure was related to the obligation to fulfil various academics tasks as elaborated below as its own concept.

6.9.1.6 Time pressure - activity rank order/rewarding activity

There was pressure on academics to spend available time on rewarding and recognisable research tasks. Most educators admitted that teaching was the primary task of academics in higher education, but that it was not as rewarding as research-related jobs. Educators felt that a substantial amount of time had to be devoted to the use of IT in teaching, especially at the initial stage of administration work arranging lab sessions, selecting IT applications, setting up systems and so on. Despite the considerable amount of time spent in the process, efforts were not considered as significant contribution in the evaluation of educators' performance. In fact, educators had to struggle to keep up with other tasks that carried weight in their performance assessment. Thus, many educators were inclined to forgo or put little effort into improving their teaching process, such as integrating IT skills into their teaching. The following comments were made:

> *"Let's say the major barrier is time. It does take a lot of time, just setting the Blackboard up takes a lot of time and effort and I think a lot of staff will say why should I? What I'm really rewarded for within the institution is research. And I think that thing is true. So, any skill based teaching, improvement, enhancement, again will meet that major barrier, are we in research? Are we in teaching? Erm, so that will be the main one I think, if the opportunity comes for doing more IT and I think that's what stopping it. You can't see any reasons why you should invest all this time developing a case study which uses financial modelling simulation for instance, if it is nothing for you as a teacher, at the end of that, in fact, there is a negative, because the time you spend on*

that, you could spend the time on research. And that's a real difficult problem to solve. I'm not sure either if it's solvable."

[Accounting Educator D]

Many educators felt that the issue prevented them and other educators from focusing their time and effort on undergraduates teaching innovation. They moved to other recognisable tasks, mainly research. Many academic staff devoted as much time and effort to research activities. It was evidence from the interviews, such as one quoted below,

"...where a lot of other staff in the school see research as the most important thing. And the reason is the rank of research, Master teaching, and undergraduate teaching, their rank order is research, research and research."

[Accounting Educator B]

Many of the educators described their work in rank order as doing research related work, supervising PhD students, teaching at master level and teaching at undergraduate level, as the example below indicates:

"...the rank order that I think we as a university, and particularly this school put on the activities that the academic staff do, where the most important thing that we do is research, erm the next most important thing that we do is teaching at Master level, the next important thing that we do is teaching at undergraduate level. Erm, and I think, that the ranking of what academics do, erm, puts undergraduate accounting education at the bottom of the pile, which is unfortunate. I think it's a shame, because, erm, the staffs that enjoy teaching, that the university puts its staff for other criteria, then you work toward the target. So, you got to produce a certain number of research papers, you could have a certain number of PhD students supervising, if you got bringing the external funding income from research than do your teaching, then it puts up at the bottom of the priority from the school, and so therefore erm you think it's up for,..."

[Accounting Educator B]

The acknowledged competition in the research environment prevents educators from allocating more time to teaching innovation, such as integrating IT skills into their teaching. They in have no commitment or motivation to spend time at undergraduate

level. Those with high interest in IT innovation, find themselves struggling with time pressure to the extent they had to use their personal time.

> *"I got to devote my own personal time to this, where I'm not going to get the recognition from the school, or from the university, for doing so. And I think that is probably the main hindrance to most staff from developing that all,"*
>
> [Accounting Educator B]

Students also noticed the priority given by some educators on research and substantial amount of time spent by them in the research activities. They felt that the commitment to research prevented educators from spending time on additional activities in teaching.

> *"Quite a lot of the people here do research and while there are some really really good tutors, who are genuinely teaching because they have too."*
>
> [Accounting Student Y3_P]

6.9.1.7 Age profile

Some educators felt age of educator to be another common barrier to integrating IT skills in teaching. They saw young educators as being highly motivated to try new things in teaching, including incorporating IT. Young educators reflected that in interviews as well as in teaching. They gave positive opinions about integrating IT skills into teaching, and also talked enthusiastically about their integration initiatives in the current practice. At that time, there were some older educators did not show any initiative of IT integration into their taught units, even though other educators felt it necessary. Some were just comfortable with their present style of teaching, particularly those being close to retirement.

> *"They must integrate accountancy packages through another integration of software and we completely don't touch anything like that at all. And again the member of staff that teaches the auditing paper, erm, is a very senior member of staff who is now retiring from the university."*
>
> [Accounting Educator B]

"I must declare that age itself is the factor. ... I think they are more difficult to [acquire] the issue [learning IT], getting older, and people like [Educator B] just sort of young people that setting the mark. For me it's very hard learning process. My machine recently set up and I haven't got e-mail on any more, so difficult to reach ISS people and try to get the e-mail sorted out, you know, it's just wasting my time."

[Accounting Educator W]

However, some educators, including ones from School of Education and School of Engineering Science, denied the age factor to be one of the barriers as some educators, who were considered old, especially in School of Education and School of Engineering Science had made efforts to integrate IT into their teaching. For them, interests override the age factor, and they argued that the older they were, the more skilful they should be.

6.9.1.8 Cost barrier

A few educators raised the issue of cost as a barrier to using IT and developing IT skills. Some considered that the introduction of IT in teaching would consume a substantial amount of the budgets available, firstly, the cost of acquisition and maintenance of software and related equipment, secondly, the cost of training educators to use them. Many educators questioned allocation of funds and whether it was justified by student numbers and educators and intensity of use. Many of them perceived it was difficult to justify, which prevented them from including IT in their teaching.

"Well I think there are always a number of constraints. One of the constraints is cost and some of the packages do cost money, and then the annual fees, not just a matter of a one off cost. If you have a cost say with 80 students on, and you pay £4,000 for some software and that's £50 for a student, you can pay that, every year a lot of money. Now given that we only really have about £200 for a student per course. That is a big expenditure. [Provided] that it is something that can be spread over more students, so the annual cost will be less, then that is more reasonable. That is the first cost, the second cost is the teacher, who needs to be able to use the materials and use the software and integrate it properly. And sometimes that can be perceived to be quite a cost in itself, that is a big learning cost to incorporate this development and sometimes

people say 'Well! o! I'm not going to be bothered with that, I just [laugh], in four or five years time somebody else who teaches on the course may bring it in [laugh]. So those are the main constraints, I think, you need an enthusiastic teacher, you also need the resources to justify it. So if something is going to be used extensively on a particular course, it is much more viable, I think, with something that might be just used for a single week."

[Accounting Educator R]

However, some educators did not see it as the barrier, as they had not faced the problem. In their experience, they had managed to get support financially from top management and successfully obtained the required software. One educator argued that the school currently had more than enough money from students' fees, and were unsure what to spend it on. The excess money could obviously be spent on IT integration efforts if the educators wanted it. Beside this, educators (including a School of Education educator) argued that, for education purposes, they should be entitled to a lower price compared with other commercial use. Thus, cost should not be a barrier.

6.9.1.9 Educator attitudes

For some educators, fear of technology was another attitude of educators, which prevented them from trying to use and develop IT skills in teaching. While some were comfortable with IT, there were still some who did not comfortable to use them and kept wondering how to deal with any technical problems. Some shared their experience having technical difficulties, such as when starting a multimedia presentation using PowerPoint in lecture, which sometimes took up substantial amount of time.

Besides this, as mentioned previously, some educators viewed that as accounting educators, their responsibilities were primarily about accounting subject matter, not including IT skills development, which should be the responsibilities of other parties, such as other educators, employers and students themselves.

They also felt that they did not have to do that, since their colleagues already did it. Even some of them never thought of integrating IT in teaching since it is not their interest.

"Honestly, it [IT integration in teaching] is not something that I ever thought about. Within the unit that I teach, I leave it to [educator B]. Anyway, erm but our programme is again is not something that I concern. I mean, teaching accounting is relatively minor part of my role in this university. I save my thinking for other matters rather than to things not directly my concerns.

[Accounting Educator N]

Some students felt that the attitudes of some educators as regards using IT influenced IT skills development in higher institutions. Some students expressed their frustration about some educators who did not make any attempt to use IT in teaching, such as providing course materials in Blackboard or using relevant software, such as accounting packages. For some students, this attitude showed educators' lack of concern about IT issue, which finally gave the impression that IT was not important element in learning.

6.9.1.10 Support

Some brought the issues of support, physical and technical support as another barrier to IT skills integration into their teaching. Some educators could not see the possibility of using IT in their teaching, because they observed a lack of facilities in lecture theatres and classes as well as technical support from expert. They viewed that all lecture theatres and classes should be fully equipped with IT facilities, such as computers, the Internet connection and LCD projectors to encourage the use of IT in teaching.

"No, I don't think we have enough support. I think one thing we need is just a kind of equipment support, at least an access to the laptop in every place in the lecture theatre. Until we get that I think it is difficult to move forward, because we don't want to move to computer lab just for one case study or whatever. It's just too cumbersome and time consuming. So, I think a lot can be done in term of support. My view is until we get that, I think we can't really move forward at all. Within the new building, that was certainly going to be provided, there is no question in the new building. So, it is coming, but it might be in the next 2 or 3 years. And also support in terms of the technical support, in terms of personnel. It's better than it was, but we need a lot more if we want to move forward in the areas we suggest here, enhance the topic in the lecture using [PowerPoint]

lecture and case studies. I think we need technical support as well as an expert. Yea, it's not going to be cheap."

[Accounting Educator D]

Besides this, some of them expressed their worries on getting technical supports, which finally caused them not to use IT in their teaching.

6.9.1.11 Students' attitudes

Some educators felt non-participative attitude of some students prevent them from integrating IT into their teaching. Some educators had experience, where students did not show initiatives to access class materials on the Blackboard, to complete class assignments given in the lab or attend the IT-based lab. One educator experienced none of his students had retrieved and copied information posted in Blackboard, while many educators found a number of students did not access the questions for class discussion.

"Not a single student has downloaded the lecture from Blackboard. So you know, we are encouraged to use IT, I'm using IT, I use that facility, I put a lecture on there [Blackboard], which they can download and save it if they wanted, and not a single student out of 60 had done it. So, you tell me how far we are supposed to go with IT?"

[Accounting Educator W]

Furthermore, a few classes held in IT-based labs were poorly attended. Many students failed to show interest in learning IT, even if they needed to learn skills in using some software. That was observed in management accounting lab sessions, where students were supposed to enhance their understanding of investment appraisal using Excel. Some educators felt that their hard work and time spent in preparing IT integration in their teaching was wasted. Thus, some of them felt not to include IT- based activities in their teaching. Educators from School of Education and School of Engineering Science did not find students' attitude as an issue, because they experienced and observed students were very motivated with IT and in using IT.

6.9.1.12 Assumptions about students' IT skills

Many educators assumed that students already possess IT skills, and they did not have to develop it again. They realised that many students used software such as

Word and Excel in written assignments, including regular class-based exercises. Thus, they assumed students were well equipped, either from previous formal education or through self-study experiences. This perception made some educators not concern about integrating IT into teaching.

6.9.2 Problems of integration

Some respondents raised some issues faced by them in their experiences to integrate IT into teaching. Besides the issues of attitude of students as mentioned in 6.9.1.11, others issues are as follows:

6.9.2.1 Physical IT resources (Support)

Some educators experienced problems related to the physical IT resources, in terms of availability, accessibility and technical support. In terms of availability, some educators experienced difficulty in arranging IT-based lab sessions. He thought the number of IT-based labs was insufficient to accommodate all requests from educators. Therefore, he decided not to have classes in IT lab and ended up using IT facilities for his own work only without extending to develop it to students. In terms of accessibility, some educators faced some difficulties to access the IT facilities. They are many steps involved and many people to go through to acquire and access the facilities, which sometimes delay their work and affect the availability of the application to students. In terms of technical support, many educators experienced problems using IT-based presentations in classes. Among the problems were missing equipment, such as pointers, difficulty in starting up the systems and interruptions in the middle of lectures. Some managed to get the technical support or solve the technical problems within a reasonable time, but most of them viewed they felt uncomfortable making students waiting for the problems to be solved. Furthermore, sometimes it was not possible to obtain the technical support.

6.9.2.2 Human Resources – teaching staff

Another problem relates to the distribution of classes among educators, because there are numerous classes conducted. Therefore, more than one educator had to teach the units. Sometimes, the educator was responsible for lecture sessions and some classes, while the rest of classes were handled by other educators, including different part time tutors who were always changing. Two main weaknesses were observed by the educator, namely lack of expertise and supervision.

PhD students sometimes act as part time tutors. They normally struggle to understand accounting concept and build hands-on expertise on the IT applications. The condition was worse; since the tutors kept changing from time to time and new training was needed for them.

The educators did not have a direct supervision on the class, since other persons became tutors for the classes. Consequently, it was difficult to monitor how far conceptual understanding was actually developed according to educators' plan.

6.9.2.3 Time constraints

Educators found a forty minute IT session was a rush, as part of the time is engaged in settling down the students and starting up the systems. This was not yet included time spent for technical problems. For them, a single slot was too short for an IT-based lab activity.

6.9.2.4 Students' attitude

Another problem faced by educators was the non participative attitude of some students as mentioned in 6.9.1.11.

The above discussion explains the issues perceived to affect the initiative to develop IT skills in teaching and the successfulness of it. The issues come from various sources, including institutional factors such as financial and infrastructure support, subject-related issues such as the content and structure, and profiles and attitudes of educators and students. These factors seem to be the obstacles for some educators to include IT in their teaching. However for a few educators who show a high interest in IT and positive attitude towards IT skills developmet, they do not consider some of the factors as barriers at all such as cost, time and support.

The next subsection elaborates the open categories, which reflect the final theme, 'the perception on gaps'.

6.10 Perception on gap

This theme covers the open categories of 'widespread of integration', 'adequacy of integration', 'perceptions on gaps' and 'suggestions for improvement'.

6.10.1 Widespread of integration

This category is about respondents' feelings about how widespread the integration of IT skills had been in the current syllabus of the accounting degree programme in School of Management. The category in 6.7.3 above had demonstrated some degree of IT skills integration in the syllabus. However, most of the respondents viewed that integration was less widespread over the three years of the programme. Some students felt that there was more space for IT skills integration in the first and second years, as their workload was considered light. In addition, some IT skills were expected in the units in the first two years of the programme, particularly the use of an accounting package in the Financial Accounting units. They felt quite busy in the third year and had to complete their dissertations, while taking advanced level units. Thus, they did not expect an additional workload of IT. However, they would prefer to have some introduction to and experience with accounting as well as tax and auditing packages in the relevant units.

Some educators felt that they were able to introduce IT skills integration in the second and third years. They also felt that there was no continuity in IT skills development across the years, which affected the learning process. In other words, the students learned the skills at one particular time, and no further enhancement occurred later in the programme. As a result, students tended to forget the skills developed in the early years of their studies.

> *"I expect more about the financial modelling particularly, I mean because management accounting is obviously my main interest, I better stick to that, and yea, we don't do much, I mean apart from, we do a little bit in first year, at the end of their first year, and we do a little bit when they do management accounting in the third year with [Name of Educator], when he does capital investment. I'm not aware there is a huge amount of other IT which is included in the content of the programme. And certainly in the second year, third year, we can do more..."*
>
> [Accounting Educator D]

Educators also found that integration occurred less in the core units in the programme. It occurred rigorously in one unit, but not in the others. For example, many IT skills integration efforts were made in management accounting units, particularly in the third year, while there was no direct integration of relevant IT skills

in the financial accounting units. They also believed there was a potential area for development throughout the three years of the programme, particularly in accounting-related packages, including spreadsheets.

> *"Erm if your question is more related to an IT type of thing, then I think they come out with the very basic of skills. Erm what they do at level 1, erm they don't practise a great deal at level 2, level 3, particularly in terms of Access and spreadsheets. And we touch again on spreadsheets at level 3. They are probably kind of best prepared in things like PowerPoint and word processing, but word processing undoubtedly in one of the main aspects they will be using as well as e-mailing, and Internet access and that is clearly going to be well skilled in that. But moving into the accounting profession, there is IT skill in terms of spreadsheets. When we look at the degree that they are doing, they do a little bit in year 1, they do a little bit in year 3, and apart from the PowerPoint, word processing, e-mail and the Internet access, which I could remember that every student had real skills in that".*
>
> [Accounting Educator B]

6.10.2 Adequacy of integration

This category is about respondents' views on the intensity of IT skills integration in the programme, which is actually related to the open categories of 'IT skills integration experience' in section 6.7.3, 'Expected skills to develop' in section 6.6.1 and 'Widespread of integration' in section 6.10.1. Despite some integration experiences, educators and students felt that it was not enough. The integration was believed to be successful in developing some basic skills in using generic software, including a word processor and PowerPoint as well as the Internet, yet some expected skills to develop, such as those related to the accounting and auditing packages, databases and computerised data, were not integrated. As mentioned previously, many students expected to learn skills using accounting-related IT packages, but none of the accounting units indicated any efforts to incorporate the packages. At the time of interview, SAGE or any accounting package was not used at all in the programme. The students as well as some educators saw the significance and feasibility of including accounting IT related packages in the current programme. They felt that the current programme had not sufficiently developed IT skills, particularly related to accounting functions.

"So, I would say the students probably graduate from UUI with a very basic level of IT skills. Yes, they can use PowerPoint, that's fine. They got that skill, they got skills in using spreadsheets, they got skill in using a word processor, so they got some basic office skills. I would say that we could do a lot more at [School of Management], in developing IT skills. Clearly what we don't do is SAGE. We could do a lot more with various databases and other financial related IT packages. So, we could improve the IT skills based on the accounting educational context for our students."

[Accounting Educator B]

Some educators were aware that some of the IT skills, such as database usage had only been introduced once during the programme, and it was considered insufficient developmentally. Particularly when the introduction had been in first year and there had been no further context for the students to enhance the skills developed earlier, which might cause them to forget the skills or to assume they was not important.

Some educators as well as students and alumni saw insufficient integration of IT in the accounting units, especially in financial accounting, auditing and tax units. Some students were really looking forward to learning accounting packages during their degree, since they perceived that the packages were widely used in firms. Furthermore, they knew that some of their friends in other universities had used them. Some alumni had the same thought; they felt that the programme should have introduced accounting and auditing packages, while they appreciated that the conceptual parts covered in the units were also important. However, they felt that some of the classes could be replaced with work using packages.

"In financial accounting, we didn't do any computer-based stuff in the first year. We didn't do anything last year [year 2] in financial accounting. It's mainly management research, when we did Excel. We didn't really use it apart from that."

[Accounting student Y3_P]

"I would suggest we are perhaps reasonably poor at integrating IT into our accounting education certainly in the area that I know in financial accounting and management accounting. There we could do a lot more, but the problem is trying to find the IT application that can be used effectively in accounting

education or in the syllabus. There is no point just going off to the IT lab for the sake of saying out that we have been using a new package and the students don't see how that integrate with the content they are studying. And thus, it does require quite a bit of rapport among the academics and the staff, sort of thing to evaluate, to learn how to use an IT package and then integrate it into the curriculum or syllabus that is being taught."

[Accounting Education B]

In general, IT skill integration in the current programme was considered as insufficient. Only a few items were formally integrated in the syllabus, with specific IT skills targeted for students; students were assumed to acquire the remaining skills indirectly while performing other activities, using PowerPoint in preparing presentation assignments. In addition, the integration seemed to focus on basic IT skills instead of skills related to accountancy. Beside that, only a certain group of educators made efforts to integrate IT skills. As a result, the integration initiatives occurred mainly in certain units, the units taught by educators interested in IT. Some educators viewed the integration as being unsatisfactory compared to other universities offering similar programmes, especially those in the new university category. Many educators believed that they could do more IT skills integration in the programme.

"I'm not aware there is a huge amount of other IT which is included in the content of the programme. And certainly in 2nd year, 3rd year, we can do more in term of IT integration."

[Accounting Educator D]

"We could do a lot more in terms of understanding accountancy packages, we could do a lot more. So, academically I think they are very good. erm IT accounting related skills, I wouldn't say that they are very well prepared at all. I think we would be ashamed if we put that against some of the new universities in terms of the IT skills-based that the new university's students left the university with compared to our students, because you know..."

[Accounting Educator B]

6.10.3 Perception on gap

'Perception on gap' is one of the open categories represents the perceptions of respondents as regards whether a gap exists between the expectations of the three main groups of respondents in terms of the IT skills development of students. The category also identifies the areas in which the gap is perceived to occur. Detailed explanation of the categories is presented in section 8.6.4 of Chapter 8.

6.10.4 Suggestions for improvement

This category is about suggestions made by respondents for the future development of the accounting programme, particularly in terms of IT skills development. The suggestions are divided into a number of areas, including IT skills to be developed in the near future, approaches that could be considered, skill-based staff and collaboration efforts. The skills expected to be developed were discussed in section 6.6.1. The common suggestion is to include accounting package as represented by the following quotation:

> *"One thing could be introduced to accounting, one could I supposed, introduce to financial accounting using computer based packages. Now, we don't do that. I know a lot of places do. I think the students are more comfortable with that, using any computer and software to understand accounting rather than they learn to use the computer packages themselves. But that's the area we don't cover, it is a basic book keeping using a computer."*
>
> [Accounting Educator N]

> *"It might be nice to being introduce to an accounting package that the client might use to record transaction and so on, just to have some exposure, because I assume they all working roughly the same way, so it would be nice to have experience of one. To have a little bit of more general knowledge of how they use them, may be."*
>
> [Accounting Trainee_V]

Some of the suggested approaches, considered appropriate and practised by respondents in the actual IT skills development process, were also considered previously in section 6.7.2.

Some respondents suggested other approaches to be taken into consideration, including allocating a double period session for IT lab activities and a small group of students in IT lab sessions. The extended time would be sufficient to conduct the lab sessions, considering the time taken for students to set up the machines, with allowance for any technical problems. The small class size would ensure that all students had the opportunity to have personal hands-on experience without having to share a workstation with other students. Furthermore, the educators would be able to engage all of the students. However, a small group size would create many groups, which would increase the workload for the staff. Thus, some respondents suggested increasing the number of staff assigned to conduct the IT-based activities only.

Permanent staff would have the opportunity to develop the skills required in handling the IT lab sessions. Another suggestion was in terms of collaborative works among academics and support staff to identify and evaluate the IT applications, to learn/teach how to use the packages and to integrate them in the syllabus. Collaborative work among academics and professionals was also considered as a potential future development, particularly to learn about each other's expectations regarding IT skills development, including the skills expected and depth of coverage, as well as relevant IT-based training.

The open categories above illustrate the issue of gaps in terms of IT skills development in the accounting programme. Many respondents, including educators and alumni viewed that the intiative is not adequate in terms of skills covered, the intensity of the development relative to the number of units as well as accounting units and to the years of the programme. From the views, it suggests that expectation gaps related to IT skills are exist and there are rooms for improvement.

6.11 Conclusion

This chapter has outlined the research themes emerging from the data collection and the analysis that guided the whole process of the research. The data collection and analysis gradually gave focus to the data that would inform the emergent issues. The greater part of this chapter has described the outcomes of the first stage of grounded theory analysis, open categories. From the iterative activities of identifying, naming and developing concepts and categories, twenty open categories were formed (Appendix L), which represent issues that were important to the participants in this research. The open categories are 'responsibilities for IT skills development', 'respondents' understanding of 'IT skills integration', 'expected skills to develop',

'skills possessed', 'selection and recruitment criteria', 'objectives of integration', 'approach to integration', 'IT skills integration experience', 'driving factors', 'determinant factors', 'motivational factors', 'support', 'external influences', 'perceived barriers to IT skills integration', 'problems of integration', 'widespread of integration', 'adequacy of integration, 'perception on gap' and 'suggestions for improvement'. These categories are discussed according to the six emerging themes.

At this stage the open categories still have a low level of abstraction but become the basis to form a higher order categories which later generate the grounded theory of IT skills development in British' accounting degree programme. The next two chapters discussed the higher order categories in a redefined contexts.

Chapter 7

Axial Coding

7.1 Introduction

The previous chapter documented the process undertaken for, and the results from, open coding. This chapter describes the next analysis procedure, namely axial coding. Axial coding is 'the process of 'relating categories to their subcategories' (Strauss and Corbin, 1999, p.123) to form major categories, which are capable of completely explaining a phenomenon. It begins with a presentation of the main activities carried out in the process of developing the major categories, the detailed discussion about them, including their relationships, will be described in the next chapter, together with the outcomes of the selective coding, except when they are mentioned here in illustrating an example of developing the major categories. This is because these two procedures appear theoretically distinguishable, yet in practice, they were very much related and unavoidably simultaneously performed. In other words, the development of major categories and their relationships is very much related to the discovering of the core phenomena, which is theoretically the outcome of selective coding. Thus explaining them in this way will give a complete picture of the story. The main process in developing the major categories is now presented.

7.2 Development of major categories

Appendix M presents a list of the main categories developed in the axial coding process. It also shows the open categories that form each of the main categories. At this axial coding stage, the data from open coding were constantly compared in terms of attributes and dimensions and between one respondent and another, in order to reassemble them to develop a more comprehensive category capable of explaining the phenomena completely. For example, the categories of 'driving factors', 'deterrninant factors', 'motivational factors', and 'external influences' have a common attribute of promoting IT skill development. Thus, these categories form a main category of 'perceived factors influencing IT skills development', as shown in Appendix M. Figure 7-1 further illustrates the development of the categories when they are then further analysed in terms of the internal or external sources of the factors, relative to the phenomena and how strong they influence the IT skills development.

Perceived factors influencing IT skills development			
What are the factors?	**Source of influence?**	**Strength of influence?**	**Direct / indirect influence?**
Employers	External	Strong	Indirect
Professional accounting bodies	External	Not strong	Direct
QAA reviews	External	Not strong	Direct
Other universities	External	Strong	Indirect
University policy	External to school (Internal to university)	Strong	Direct
Determinant factors (Value added to learning process)	Internal	Strong	Direct
Motivational factors (Highly interested educator = catalyst)	Internal	Strong	Direct

Figure 7-1 : Sample work of developing main categories I

In this case, it is whether the factors were under or beyond the control of the school that offers the accounting programme. If it is belongs to the school, such as the issues of IT-based support in the school or issues related to academic staff, it is considered as internal, having a direct impact on the occurrence of the phenomenon of IT skills development. Another dimension discovered was in terms of how strong are the influences towards the occurrence of the phenomenon. The above have illustrated the obvious analytical thinking emerging from the data.

It could not be avoided that thinking how the categories link to each other starts to occur during the open coding. As a result, some of the open categories, such as 'perceived barriers to IT skills integration and 'suggestions for improvement', developed in open coding, as documented in the previous chapter, were considered as major categories, for example, the open category of 'perceived barriers to IT skills

integration, as described in 6.9.1, which gathers all the factors that possess the attribute of interfering in the development of IT skills. This category is already capable of explaining the complete story of a phenomenon of interference in IT skills development. Therefore, it is considered as a main category (renamed as 'perceived barriers to IT skills development'), which is also related to 'perceived factors influencing IT skills development' category by moderating the degree of influence of the factor. This relationship is clearly shown in Figure 8-1 of Chapter 8.

In comparing the categories to uncover their relationships, many questions were frequently asked, such as 'What does this category represent?', 'How does it link to other categories?', 'Is it a cause of anything?', 'Is it an outcome of a process?' 'What impact does it make?', 'How does it influence the phenomena?', 'What phenomena does it lead to?' and so on. These questions helped to discover relationships and further develop the main categories.

From the above processes, seven main categories were delineated from the twenty open categories as presented in Appendix M. More definitive labels were used for the main categories to represent the conceptual meaning behind them. The table in Appendix M shows that most of the major categories were developed from more than one open category. This has been explained earlier, and is basically due to a sharing of a common property. Furthermore, there are major categories, such as 'perceived factors influencing IT skills development' and 'perceived factors intervening IT skills development', basically constituted from the same list of open categories. Figure 7-2 illustrates the analytical process and shows how the dimensional range of a property in the same open category may lead to the development of more than one major category.

Open Category	Property/ Subcategory	Dimension	Dimensional Range	Main category
Responsibilities for skills development	Who are responsible?	In what way does it influence IT skills development?	Promote – moderate	
	Accounting programme / educator		promote	Influences
	Student-self development / Students		moderate	Intervening factors
	On job training / Employer		moderate	
	Students support centre		moderate	

Figure 7-2 : Sample work on developing main categories II

The above figure shows how the open category of 'Responsibilities for IT skills development' lead to both a main category of 'influences' ('perceived factors influencing IT skills development') and 'intervening factors' ('perceived factors intervening IT skills development'), depending on the way it influences IT skills development. For example, the views that the accounting degree programme is responsible for helping students to develop their IT skills through the learning process will promote IT skills development in teaching. Thus, in this case, the open category of 'responsibilities for skills development' explains itself as 'factors of influences'. However, if the view that skills development is not the responsibility of the accounting programme, but the responsibility of others, such as students or employers, this view will moderate the initiation to develop the skills into teaching. In this case the category of 'Responsibilities for IT skills development' explains itself as 'intervening factors'.

The above examples have illustrated the major work involved in the development of main categories.

7.3 Conclusion

This chapter has described the main process involved in the axial coding, which developed seven main categories from twenty open categories emerging from the data during open coding. The main categories are perceived factors influencing IT skill development, perceived barriers to IT skill development, IT skills development approach, IT skills developed, widespread and adequacy of integration, perceptions on gaps, and potential future development. Some of them actually emerged and developed during open coding, while others were developed during axial coding. This chapter only highlighted emerging relationships among some of the main categories, while illustrating the development of the categories. Details of the main categories and their relationships will be explained in sections 8.4 to 8.6 of Chapter 8, which presents the final analytical process in grounded theory, namely selective coding.

Chapter 8

Selective Coding

8.1 Introduction

This chapter presents the final analytical process of grounded theory, selective coding and its outcome, the emergent substantive theory. Selective coding is "the process of integrating and refining the categories to form a larger theoretical scheme that the research findings take the form of theory" (Strauss and Corbin, 1998, p.143). Substantive theory is a theory developed from data collected in a specific area of study. It can only be used to explain the phenomena investigated (Strauss and Corbin, 1998). During the process, a paradigm (model) is used. This chapter next briefly describes the paradigm model and its application in the research, followed by details of emerging substantive theory.

8.2 The paradigm model: an analytical tool

As highlighted by Strauss and Corbin (1998), a paradigm is a "perspective taken toward data, another analytical stance that helps to systematically gather and order data in such a way that structure and process are integrated" (p.127). It comprises four basic elements, labelled conditions, actions and interactions, phenomenon and consequences. These components were defined in Chapter 5, section 5.11.2. The next section briefly explains the application of the paradigm in this research.

8.3 Application of the paradigm

This study employs a paradigm as a supplement to other strategies (such as comparative analysis and asking questions particularly when it was difficult to see the linkages between the categories). The paradigm was used from the axial coding stage. It facilitated the conceptualisation of the relationships between the categories. At that stage, the core phenomenon had started to emerge. For example, when analysing the issues of employers' expectations about IT skills, other universities' practices in IT, and staff interest in IT, their association with IT skill development was uncovered. The perceptions of educators on these issues caused them to develop IT skills in their teaching. Further analysing the issue of how the skills were developed further uncovered its relationship with the issue of what are the perceptions of educators about responsibilities for IT skills development. The perceptions of

educators about who is responsible for IT skills development of students determined whether the skills were developed in their teaching or not. Those are a few examples of uncovering the relationships between the phenomena. Continually linking the categories and conceptualising their relationships using the paradigm finally offered a complete picture of the research phenomena. At this stage, the core phenomenon of conception-driven IT skills development clearly emerged; it links all the categories and reveals the complete story. Consequently, substantive theory was generated, which explains and helps to understand the phenomena of IT skills development in accounting education.

The following sections, 8.4 to 8.6, elaborate the paradigm model, beginning with the core phenomenon or the central events of the study and the activities that form the phenomenon. The elaboration is then followed with the conditions, which are a set of events that create the situation, issues and problems pertaining to the phenomenon and the consequences or outcomes of the phenomenon. This will clearly and completely describe the natural generation of the core phenomenon, which represents the emergent substantive theory.

The core category of this research was conception-driven IT skills development. It is not one of the major categories but the conceptual thought that emerged while integrating and refining the categories and their relationships. These conceptual thoughts connect all the categories and capture the main story of this research. These theoretical concepts emerged naturally from the data without forcing. The discussion of the connections among the categories flowed logically and consistently, as presented in the following sections (with no forcing of data). The phrase used to present the core phenomenon in this research was abstract enough that it could be employed in other substantive areas, towards a more general theory generation. It has been seen that the conception-driven IT skills development approach gradually grows in depth and explanatory power when integrating other categories. Finally, the core phenomenon was also capable of consistent explanation of the main points when the conditions were varied. In conclusion, the core phenomenon completely justifies the selection of it as guided by Strauss and Corbin (1998).

The core phenomenon is now described.

8.4 Core phenomenon: conception-driven IT skills development

The main phenomenon of the research is conception-driven IT skills development. The phenomenon involves a process of conceptualising ideas with regard to certain

relevant elements such as teachers (educators), institutional culture, responsibilities for skill development, technology, learning, syllabus, students, support, and employers, and how these conceptualisations contribute to the perceived appropriate approach to IT skills development in the teaching process. It was evident that all participants, including non-accounting educators had their own conceptions regarding IT skills development. However, it was felt that the conceptions or the conceptualisations among educators would determine IT skills development in the teaching process.

The perception was based on the reasoning that an educator who teaches a particular unit has ultimate control of the unit taught as well as direct involvement in the actual teaching process. Although students were directly involved in the process, they had no direct control over the content of the syllabus or its delivery. In terms of employers, there was also no experience of direct involvement in the design process of the syllabus. At this time, there was no communication between the employers and educators over the issue, although some contact was arranged between employers and students, especially in terms of career opportunities and placements. Several ideas about employers were based merely on educators' own perceptions and observations. Thus, in this case, the educators who taught the units had the final say on what to teach and how to teach it.

In other words, it was observed that educators were the actors playing a major role in creating the core phenomenon. Consequently, in elaborating the core phenomenon, emphasis is given to the conceptions of educators and how they influenced the IT skills development approach. The conceptions made by others (such as students and employers) were considered and compared as well as discussed and presented in other parts of the paradigm model, namely the contextual conditions and the outcomes components. Issues perceived by the educators are discussed in accordance with different areas as follows:

8.4.1 Educators

Educators had some perceptions about themselves, which influenced their decision to develop IT skills through their taught units. Among the factors were interest, personal motivation, past teaching experience, knowledge and skills, age profile and responsibilities. Some educators perceived that their interest in IT had encouraged them to integrate IT skills in their teaching. Conversely, a group of educators did not

show any IT skills development in their taught units and they admitted that they were not interested in it.

Educators' perceptions on personal motivation also determined IT skills development in teaching. The educators who actively integrated IT in their taught units expressed that their personal motivation drove them to plan and include IT in their teaching.

Another factor is past experience. There were educators who integrated IT into their teaching based on their past IT integration experiences, either at their former or at their present institutions. Accordingly, some educators did not initiate any IT skills development because they had no experience of IT skills integration. Moreover, they considered this (no IT skills integration) as normal practice, based on their experience and observations at other universities.

Another issue is about the IT-related knowledge and skills possessed by educators. Some educators believed that their knowledge and skills in IT had influenced them to include it in their teaching. They also did not deny that this issue has a strong link with interest and personal motivation. Their interest in IT motivates them to acquire or enhance their IT-related knowledge and skills.

Some accounting educators perceived age as another issue influencing integration initiatives. They normally relate the issue to soon-to-retire staffs. They perceived that soon-to-retire staffs have no interest in integrating IT or any teaching innovation. While this appeared true in some cases, some young teachers also failed to show interest in it. The educators in the two other schools disagreed with the notion that older educators do not integrate IT in their teaching. They believed that the older they were, the more experienced and skilful they would be. They proved that IT had been used by all ages of educators in their schools. Non-IT use was exceptional case in their schools.

Perceptions on their responsibilities are another issue that influences IT integration efforts. On one hand, some educators perceived IT skills development of students to be their responsibility and showed some effort to develop it through their teaching. On the other hand, there were educators who assumed that to be the responsibility of others, such as the student support centre, and they showed no intention concerning or interest in IT integration in their taught units.

The above elaboration has shown how the perceptions of educators of issues related to them influence IT skills development. The next section is about educators'

perceptions about institutional culture and how the conceptions impact the IT skills development process.

8.4.2 Institutional culture

Educators had some perceptions about issues concerning institutional culture that had an impact on the IT skills integration process. First, most educators had a belief that the main focus of an traditional university was to nurture students towards academic excellence, whereas the focus of a new university was to develop vocational skills. As this research studies the experience of an traditional university, many of the interviewed educators perceived that developing IT skills was beyond their scope of responsibility. Thus, they did not show a strong commitment to integrating IT into their taught units.

Secondly, on one hand, most educators believed that research-related activity was the most significant contribution towards promotion and career development. In other words, educators conceived the idea that time spent on research activity was more valuable and acknowledged than time spent on teaching preparation and innovation. Thus, it was observed that many educators focused only on research and totally ignored teaching innovation, including the integration of IT skills into their teaching. On the other hand, there were some highly motivated and interested educators who generously allocated their time to the extent that they used their own time beyond office hours to plan and design IT integration into their teaching activity. In general, educators regarded research as the highest priority and the task most acknowledged by the institution and they were not willing to spend time on teaching improvements such as considering IT in their teaching, except for those who had an interest in IT.

8.4.3 Responsibilities for IT skills development

Different conceptions of how IT skills could be developed by students determined the occurrence of and the approach to integration. Some educators had reservations about the issues and considered that skills development was beyond their responsibility; it belonged to other parties, such as employers, student support centres and the students themselves. Many of the educators believed that students should develop skills such as the ability to use IT-based applications during job training. In other words, it was assumed that employers were more responsible for providing IT training for their recruits. Besides this, they also considered that an institution should establish a centre responsible for providing the relevant training needed by students. Therefore, they expected students to consult the centre about

any skills, including IT skills. More to the point, some educators took the issue of IT skills development as the students' own obligation. They argued that students were responsible for acquiring the skills by themselves. All of these conceptions indicated no requirement to develop the IT skills needed by students beyond graduation and even no or little use of IT as a teaching tool.

On the other hand, some educators were willing to assume responsibility. They argued that, instead of totally leaving it to employers to train the students or waiting until they learned during job training or assuming that they should obtain the skills by themselves, educators should also encourage students to attain the skills by providing contexts which enabled students to develop the skills. These conceptions led the educators to provide a platform for students to have either direct or indirect exposure to IT. Some educators incorporated it into the taught units by demonstrating the software and letting the students experiment with it in the IT lab. At the same time, some educators did not formally train students but assigned them to use particular software to complete coursework and considered the use of it in assessments. Whatever the approaches were, they merely believed that providing the context in teaching and learning would promote students to develop the skills. Hence, there was evidence of IT skills integration in the units taught by the educators who possessed the above conceptions.

8.4.4 Technology

Some educators believed in the benefits that they could enjoy from using IT in their teaching. They perceived that IT helped them to save time, both in the short and in the long run. For example, using IT enabled them to deliver mass lectures, to all students at once. As a result, it saved time, in the sense that they just had one class instead of a number of classes. Besides this, the educators also perceived that IT could help them in managing their work at their preferred time. For example, by setting up a bulletin board, one advantage was that the educators could consult students on any issues raised by them without meeting them physically. Moreover, this benefited all the students, not just the one who brought up the issue, as would have been the case, if it had been done through face-to-face consultation. Furthermore, the educators could set up specific times to answer questions and reduce the time spent meeting different students about the same issues. Thus, having the conception of using an IT-based facility such as bulletin board in teaching assisted educators in managing their consultation times. Some of them thus started to integrate IT into their teaching. Despite spending a considerable time in preparing

lectures using IT, they believed it paid off in the long run, as they benefited from the time saved in the overall teaching process. These conceptions led the teachers to integrate IT into their teaching. Conversely, some educators felt that the time spent designing IT-based lessons, setting up facilities and maintaining them was very demanding. Consequently, they preferred not to do this and retained the minimum use of IT, particularly for their own use only.

Besides integrating IT, based on the conception that it benefited them, some educators did it because they felt it gave benefits to students. One of the benefits for students as perceived by educators was in terms of communication. For example, by introducing an electronic discussion board, students could raise any issues regarding the lesson without meeting the tutors. Another benefit was in the form of gaining understanding of conceptual issues. Educators perceived that using an approach close to the one used in real practice helped students to grasp the concepts better. For instance, using IT packages such as the financial modelling features of spreadsheet packages or any financial modelling packages facilitated students' understanding of the concepts and issues related to the lesson, such as investment appraisals, budgeting and so on. These educators also believed that textbook-based exercises were not enough to frame the concepts. The notions translated into their teaching approach, using IT packages to demonstrate the concepts and arranging IT lab-based activities to give experience to students in using and applying the packages.

Nevertheless, some educators perceived that there were some drawbacks for students as regards implementing IT in teaching. Firstly, they perceived that students were taking advantage of having lecture materials on a website and failed to attend lectures or classes. Secondly, they considered the practice of having lecture materials online unintentionally transferred printing costs to students, where previously they did not have to pay for materials provided in handouts. Considering these issues from the point of view of students, these educators were not so much in favour of using websites to post teaching materials. This perception was clearly shown through the minimum use of IT even as a teaching tool.

Another issue was the perception of the role played by IT as an alternative medium to teaching. Some educators perceived that IT was only one of the various available approaches to teaching. In other words, IT was not the only way of teaching. Educators with this perception seemed to favour other approaches rather than IT, and showed no integration effort to develop IT skills in their teaching even with the

minimum use of IT as a teaching tool. However, some believed that IT was an alternative method of teaching, which could be used productively and efficiently to demonstrate academic concepts. Students would be gaining dual benefits: one, understanding the academic discussions, and two, knowing how to use IT in relation to the concepts. These perceptions led to initiatives regarding IT integration into teaching which appeared in some of the units taught.

8.4.5 Learning

A few educators had a strong view that IT could enhance students' learning processes. They had a ground rule that IT should be employed whenever it helped to boost students' understanding of academic discussion. Sometimes they just incorporated IT whenever appropriate, since they believed it would benefit students in the end. As a result these educators searched for any possible opportunities to slip in IT packages and lab activities in which students could have hands-on experience of the software to reinforce their understanding of the academic discussion during lectures. There were also educators who thought that using IT could help them to create an enjoyable learning environment. They believed that IT was a good alternative approach to meeting the expectations of students who liked different approaches and activities. Thus, with these perceptions, introducing IT became one of the priorities in their teaching strategy, as evident from their practice.

8.4.6 Syllabus

There were two common issues related to the syllabus, as raised by the educators. Firstly, there was the issue of the tightness of the current syllabus both in terms of the content of individual units as well as the structure of the whole programme. Most of the educators perceived that the current syllabus was very packed, both in terms of the single accounting units and the whole programme structure. In terms of units, they perceived that there was no room for additional lessons on using accounting or financial-related IT packages. They felt that all the existing content covered in the units was important and could not be dropped from the syllabus or be replaced by any IT-related lesson. The same perception was reflected across the whole design of the programme, which was perceived to be tight and as having no space to slot in extra units on an accounting-related IT unit, such as a single unit of financial modelling or a unit that covered the use of accounting related IT packages. In addition, they observed that none of the present units could be omitted to give way to a new accounting-related unit. These conceptions led the educators to neglect any

initiative to incorporate IT in their teachings, and some of them did not think about including IT in their teaching at all.

Secondly, there was the issue related to the main focus of the undergraduate accounting degree programme. Many of the educators emphasized the main focus of the degree programme, which was to instil the conceptual understanding of accounting instead of the vocational or practical skills of accounting. Furthermore, they viewed that including IT in teaching and learning, such as by the introduction of accounting packages, for example SAGE in a financial accounting unit or an IT package in an auditing unit, was more about developing vocational skills, which was beyond the focus of the programme. Thus, they did not favour embracing any IT package and chose to concentrate on the discussion of the theoretical and conceptual parts of the subject. However, there were some educators who were convinced that using IT could helped them to demonstrate certain accounting concepts effectively and that led students to understanding them better. This group of educators showed some efforts towards IT integration in their taught units.

This elaboration has shown how the perception of educators of the tightness of the syllabus and its academic focus led them to exclude IT from their teaching. On the other hand, it was also evident that those educators who regarded IT as an effective way of enhancing students' learning and conceptual understanding considered IT and included it in all possible ways in their instructional design. In summary, it was observed that the decision to include or exclude IT in teaching was greatly influenced by the ways educators perceived the features of the syllabus and the role of IT within it.

8.4.7 Students

Educators also had some conceptions related to students, which can be elaborated under the following issues. Firstly, there were the conceptions of educators about the expectations of students regarding IT skills development in the programme. Educators perceived that the current environment provided students with high expectations regarding IT skills development. With this conception in mind, the educators felt that they were responsible for meeting the students' expectations and put some effort into including IT integration in their taught units. At the same time, some of them, although they had realized the expectations of students, perceived that skills could be developed in other ways, such as through a student support

centre, or through other educators or students' self-initiated learning. Thus, this group of educators showed no intention of including IT in their taught units.

Secondly, there were perceptions regarding the IT skills currently possessed by students. On one hand, some educators assumed that students had already acquired certain IT skills from their previous learning and perceived that to include them again in a taught unit would be merely repetition instead of developing new skills. Thus, there was no IT skills integration implemented in the taught units by these educators. On the other hand, some educators felt that to include IT skills, which it was assumed were already possessed by the students, could help them to know whether the students really possessed such skills. If that was the case, instead of repetition, they perceived that reinforcement would enhance the students' skills. This argument led the educators to make some IT integration efforts in their teaching.

Thirdly, there was a perception regarding the attitudes of students towards using IT facilities and participating in IT-based activities. Some educators preferred not to use IT in their teaching, based on their conception that a great number of students did not have any interest in or appreciate such an approach. For example, many of them expressed their frustration at students' attitudes towards accessing web-based facilities provided by them. A majority of students did not bother to retrieve lecture materials from the web. Based on this experience, the educators decided not to add any other IT skills, since they felt it was not worth their time designing IT-based instruction, when the students did not use it. Besides this, the educators also perceived that the IT related unit was not popular with accounting students, as experienced before, when an accounting information system unit was introduced as one of the options. Only a few students registered for the unit, causing it to be dropped from the syllabus. Based on this perception, they did not see any reason to introduce other IT-related content.

Nonetheless, there were educators who included IT in their teaching based on their perception that students enjoyed the class with its different approach, particularly the exposure to IT and the opportunity to use the IT packages. In addition, these educators had a strong belief that using IT could accelerate the learning experience of students. Even though the majority of students did not make any attempt to complete the IT-based activities, there were some who demonstrated a high interest in and appreciation of the approach. This could be seen through their commitment in completing lab-based activities, answering IT-related question in the examinations, and giving positive feedback in the course evaluation.

In conclusion, some educators integrated IT in their teaching because they believed that the students enjoyed and gained some benefit from it, whereas some did not integrate it in the belief that students did not have any interest in it.

8.4.8 Support

There were different views regarding the support available in terms of physical IT-based facilities. Some educators perceived that there was not enough physical support provided, such as an IT-friendly environment in the classroom and lecture theatre. Moreover, they perceived that the number of IT labs was insufficient, particularly in the case when large number of students had enrolled in a particular unit. Consequently, it was difficult to arrange IT-based activities. Based on that perception, they did not consider using IT-related tools or activities in their teaching. On the other hand, some educators felt that they had no problem in obtaining or arranging the facilities and hence made an allowance for IT skills development in their taught units. Educators from other schools were also satisfied with the IT facilities provided by the university. They felt that the IT-based facilities, including the physical and technical as well as knowledge support, were excellent and far advanced compared to some other universities. They experienced no problems in integrating IT skills in their taught units.

8.4.9 Employers

One of the issues related to employers was educators' perceptions concerning the expectations of employers about the IT skills possessed by graduates. Most educators were aware of the importance of IT skills in the working environment. Many of them assumed that employers expected students to gain some IT skills while doing a degree. A few of them took the perception positively and, while believing that it was impossible to develop all the required skills, they tried to integrate IT into teaching wherever feasible. However, some of them considered that employers were always dissatisfied with what was done in academic institutions. This group of educators merely put aside employers' expectations and seemed to have little or no interest in considering the development of IT skills in their teaching. As a result, there was no IT integration effort in the actual teaching practice.

Another issue related to the various features of IT applications. Many educators took the view that there were various types of software applications or information systems and perceived that different companies used different applications. They argued that it was not feasible to develop skills in using all systems and not practical

either to consider just one of them, since the students might join a company that did not used the selected system. Conceptualising the idea in this way has ended up with the educators having no IT skills integration in their teaching. However, some educators, even though there was a choice of applications, believed that there would be common features among them. Thus, they thought that introducing any of the applications would develop skills in using that particular application that could be transferred when using similar applications. Students would at least have had some experience in using IT packages, which give them added competitive value. Conceptualising this aspect of technology, and the significant value of having experience in using any of the packages, has contributed to a favourable perception and some indications of IT skills development in teaching.

The above has elaborated the core phenomena of conception-driven IT skills development. It was observed that the ways educators conceived their ideas related to areas such as teachers, institutional culture, ways of developing IT skills, technology, learning, the syllabus, students, support and employers had been transformed into actual ways in which IT skills development was implemented by the educators. It was also observed that some of the issues were interrelated, such as issues of institutional culture and syllabus, issues of technology and learning, and so on. In general, the interest of educators seemed to influence perceptions on other issues, because educators with a strong interest in IT and teaching innovation appeared to look positively on other side issues, ending up with IT skills integration in the taught units. On the other hand, the educators who seemed to have no interest showed no or less commitment to initiating any IT integration effort into their teaching.

8.5 The contextual conditions of the conception-driven IT skills development approach

"Conditions" are one component of the paradigm model, representing "sets of events and happenings that create the situations, issues, and problems pertaining to a phenomenon and, to a certain extent, explain why and how persons or groups respond in certain ways" (Strauss and Corbin, 1998, p.130). Specifically, they are contextual conditions, causal conditions and intervening conditions. Contextual conditions are made up of causal and intervening conditions, which combine with one another, setting the background for the phenomena. The following elaboration will be based on causal conditions or intervening conditions, depending on the type of

influence that the condition has, namely whether it triggers or impedes the occurrence of the phenomena.

8.5.1 Causal conditions: perceived factors influencing development

As mentioned above, causal conditions are those contextual conditions that in some way direct the occurrence of phenomena. Some causal conditions arise from outside sources (external conditions), which are those sources beyond the control of the school. In this study, they are termed 'perceived external factors of influence'. Other come from sources close to or within the school and can be regarded as internal, termed 'perceived internal factors of influence'. The details of them are discussed next.

8.5.1.1 The perceived external factors of influence

Based on the data, five issues were identified and labelled as perceived external factors of influence. They were University policy, IT skills integration practice in other universities, employers' requirements with regard to IT skills, quality assurance review by a quality assurance agency, and professional course accreditation or professional examination exemption by professional accounting bodies.

Educators believed that issues of University policy, quality assurance review and professional course accreditation had a direct effect on curriculum design, including IT skills integration, but with different degrees of influential force. They considered that University policy was a strong force for IT development in educational programmes, because of the view that faculties and schools within the University would carry out the policy of the University. If the University had a policy that emphasised using IT in teaching, the policy would spread to the faculties, which were responsible for implementing it. They observed that there was no specific indication of the policy of the University regarding IT integration. Quality assurance review was also considered a strong factor influencing the design of the programme, yet at the moment not so strong in terms of IT skills integration. This was because the reviews, for example those carried out by QAA, only gave general guidance or broad requirements concerning IT skills in the programme. Professional course accreditation used to have some influence through considering the coverage of IT as a unit taught in the programme. However, the requirements kept changing and finally IT coverage came to be no longer emphasized by many professional bodies, except the Institute of Chartered Accountant of Ireland (ICAI). Hence, at the moment this issue can be considered less influential.

IT skills integration practice in other universities only indirectly influenced the integration process, yet was considered as a strong force. It was considered as indirect since other universities did not have any direct link, such as collaborative work in developing the accounting degree programme, between their business schools and the school under investigation. However, what had been done in other accounting degree programmes had a great impact in the area of competition. To stay competitive, the educators believed that they should observe what others were doing and keep ahead of them. In the case of IT skills development in the programme, since everybody, especially new universities, was working towards its, it became a key target for the programme to follow progress in order to keep pace. Thus, it appears that this factor strongly influenced the phenomena of IT skills development.

The same can be said for the issue of employers' expectations regarding IT skills. Educators believed there was no direct influence from employers, as at the time they did not have any liaison with employers. Most educators assumed that employers were expecting graduates with IT skills, based on their observations and perceptions of the current IT-based working environment. Despite this awareness, educators had no idea what IT skills the employers specifically expected, but believed that basic skills, such as using a word processor, spreadsheets, e-mail and the Internet, were important for graduates. Even though there was no direct relationship between employers and educators, educators considered that perceptions of the expectations of employers regarding IT skills were a very strong factor influencing them to integrate IT into their teaching.

All of the above issues were perceived as either directly or indirectly influencing the process of developing IT skills into the programme, each with different degrees of influence. Overall, they were all deemed to be externally activating factors regarding the integration initiative.

8.5.1.2 The perceived internal factors of influence

The perceived internal factors of influence were issues that were internally raised and generated the IT skills development. The factors were subdivided into two, a 'perceived determinant factors' and 'perceived motivational factors'. The 'perceived determinant factor' was the judgment as to whether IT could enhance students' learning or not. Many educators frequently raised this issue when giving their opinion regarding IT skills integration in their teaching. They would consider integrating IT

into their teaching if using IT helped them to add value to the students' learning process, such as promoting their understanding of academic concepts. Otherwise, they preferred other approaches to IT. However, some of the educators simply integrated IT as a result of their strong interest in it and belief in its benefits, although the benefits were not clearly identified at the initial stage. Based on their past experience, they considered that integrating IT did help to enhance students' interest and understanding of conceptual discussion.

The 'perceived motivational factors' comprised a number of issues. The interest of educators was one of the major motivating factors for integrating IT into teaching. Highly interested educators appeared to integrate IT into their teaching and saw it as something feasible, financially and operationally. This perception was also evident in the other two schools, which saw IT skills integration as necessary in the modern teaching. The educators showed a high interest in the issue. On the contrary, those who had no interest in IT directly admitted that they would not integrate IT or spoke about the many problems that prevent them from conducting IT skills integration in their taught units. Some educators proposed that somebody should be a role model or play a role as a catalyst, who would motivate others to follow. Besides setting an example, they could share their knowledge and expertise with others. This would motivate those educators who wanted to integrate IT into their teaching but lacked the knowledge and skills to do so.

Fulfilling the expectations of students regarding IT was another factor that motivated educators to include IT in their teaching. Educators believed that students were looking to develop some IT skills while studying a degree that would later give them added value in getting a job. Considering this, some educators felt motivated to incorporate IT into their teaching. Third, the availability of IT-based support also motivated educators to use IT in their teaching. Some educators argued that the availability and accessibility of physical facilities as well as knowledge support could motivate them to consider IT in their teaching. Last but not least, educators suggested that the benefits offered by IT motivated them to use it in teaching. Some of them enjoyed the benefits in time saving and managing resources as well as in communicating with students.

In general, all of the internal factors directly impacted the development process. In terms of strength, they were considered more influential compared with the external factors. All of the internal factors were perceived to have a strong influence, especially the motivating factor of highly interested and motivated academic staff,

who expected to be a catalyst and to take the initiative regarding the integration process.

8.5.2 Intervening conditions: perceived barriers to integration

Besides the factors behind the phenomena, some factors emerged and were perceived as mitigating the process; these were categorised as perceived barriers to integration. All of them were considered as internal issues since they were raised by internal sources and could be further divided into three subcategories, academic staff-based barriers, environmental-based barriers and student-based barriers.

8.5.2.1 Academic staff-based barriers

A few issues related to staff appeared to slow down the integration process. Among these issues was lack of personal interest among the academic staff in changing their teaching approaches, including using IT. This issue became a major barrier to the development of IT skills for students through the teaching process. Next, most educators had a lack of knowledge regarding which skills to develop and which IT packages were available for introduction to students in higher education. This issue also slowed down the process. Besides this, some of them had been introduced to or had come across a package but were not familiar with using it.

Consequently, they were not keen to introduce the package in their taught units. The situation was worse when these particular educators also had no interest in it, as they would make no effort to learn it. Last but not least, there was the issue of age profile. Soon-to-retire academic staffs were perceived as another barrier to IT skills integration. Considering that this group was not familiar with IT, it might be hard for them to see the benefits of it or to pursue the knowledge and skills to be able to integrate it into their teaching. As, they were going to retire soon, such changes offered them no reward. Thus, these mixed issues mediated and even sometimes prevented initiatives to incorporate IT into the teaching process. This situation was made to look worse when the other two schools found that almost all of their staffs were interested in IT innovation, had a reasonable amount of IT knowledge regardless of their age profile and included IT in their teaching. The next issues to consider are the barriers related to the environment.

8.5.2.2 Environmental-based barriers

Environmental-based barriers included issues related to the type of university, time, syllabus constraints and cost, which were all considered as situated within the

internal boundaries of the phenomena. Educators had to divide their time over many tasks, including research, teaching and administrative jobs. The issue was perceived as creating problems since the tasks had different weights concerning promotion. For instance, in an traditional university, research-based activities, including applying for grants, research supervision and so on were considered as highly recognizable tasks, whether this was stated or not. They were culturally built into the academic environment of the traditional university. Thus, this situation created tension for educators, as they had problems managing and allocating their time between tasks, finally ending up with little or no time spent on teaching innovation, including integrating IT. They normally chose to allocate time for research because it was a priority and made a recognisable contribution towards promotion, compared to teaching innovation. Besides time pressures to fulfil various tasks, educators were also faced with time pressure to complete the syllabus.

Many educators raised the issue of the tight nature of the syllabus as a factor that prevented them from including IT-based activities in their teaching. In addition, some of the syllabus required educators to be always alert to changes, such as in pronouncements on accounting standards, which impacted the content of the syllabus. The substantial time spent monitoring such changes and updating the contents of the syllabus prevented them from making other changes in teaching, including developing transferable skills, including IT skills. Some educators also perceived that cost was another factor preventing them from integrating IT in their teaching. Developing skills in using particular software meant some investments had to be made to acquire software, and that meant an extra cost to the school or department. Moreover, they were uncertain as to whether the budget would allow it, especially when the use of the software would be limited to a few hours of teaching. This perception of cost in terms of the extra amounts to be incurred and the uncertainty regarding budget allocation became a barrier for some educators to incorporating IT into their teaching. The next issue to be considered is the barriers to development, which were related to students.

8.5.2.3 Student-based barriers

There were two factors relating to students that discouraged educators from using IT or developing IT skills in their teaching. One of the factors was low participation of students in IT-based activities. For example, many students did not take advantage of the initiative and access course documents provided through the online

Blackboard system. Some educators also experienced low participation from students in terms of completing IT-based class exercises. Only a few students showed interest by trying to complete the exercises.

The above outcomes were frustrating for some educators and discouraged them from making further IT innovation in their teaching. Another barrier associated with students was the belief that students already possessed or should possess IT skills gained from their previous formal or informal learning experience. Thus, the educators assumed there was no need to develop the skills again in higher education programme, to avoid repetition. Furthermore, some of them believed that it was more the responsibility of students to develop the skills by themselves or wait until they had job training. These perceptions actually prevented educators from taking initiatives regarding IT skills development.

It emerged that lack of personal motivation and interest in IT among academic staffs was the biggest hurdle or impeding factor. The rest were considered as minor or side issues, which could be moderated or eliminated once the educators had a strong interest in IT. At the moment, the combined force of the various factors has a great impact on the process of developing IT in teaching.

This section has elaborated the contextual conditions surrounding the core phenomena. Some factors have been identified as triggering and leading the IT skills development process, and some have acted as obstacles that restrain or limit the process. The next section details with the consequences of the core phenomena of conception-based IT skills development, which arise within the contextual circumstances mentioned above.

8.6 Consequences of the core phenomena of conception-based IT skills development approach

"Consequences" are another element of the paradigm model, representing the outcomes of actions and interactions performed by actors in response to the contextual conditions that form the core phenomena. In this case, the action and interaction between educators, students, the support centre and the syllabus, led to conceptualization activities, which then influenced IT skills development, as previously discussed in the core phenomenon section. The phenomenon of conception-driven IT skills development produced some perceived outcomes, which are discussed under the following categories.

8.6.1 IT skills development approach

The pre-conceived idea of educators on the related issues discussed in sections 8.4.1 to 8.4.9 resulted in different approaches to developing IT skills into their students. The range is from zero integration in the teaching of units to well planned integration.

8.6.1.1 Zero integration approach

The zero integration approach means no initiative to develop IT skills in taught units. The approach is employed by those educators who perceive IT skills development as not being educators', but others' responsibility, including students themselves, the students support centre and employers. The no-integration approach to IT skill was also observed in the units taught by those educators who have low or no interest in IT, low personal motivation, and lack of IT-related knowledge and skills. Perceptions on students' current skills in IT and students' attitudes towards IT also led to no integration of IT skills in taught units.

8.6.1.2 Integration approach

Another development approach emerging from this study is integration. It means either directly or indirectly incorporating IT skills in taught units. Direct integration means a well-planned instructional design, which clearly sets targets for developing particular IT skills. The skills are developed through planned activities in an IT-based lab. An example of the direct integration approach is the arrangement of IT-based lab activities for management accounting units in year one of the programme. The purpose is to enhance students' skills in using a spreadsheet and to promote students' understanding on the organisational use of spreadsheets. Students were given a case scenario, for example creating a cash flow spreadsheet, and they were provided with instructions that guided them to complete the assignment. They could follow the instructions and develop the skills at their own pace and have opportunities to consult the tutor.

Another example of the direct integration is having IT-based lab sessions that guide students to use the statistical functions of Excel in a management unit in year two. Another direct integration is the use of computer-based assessment.

The indirect integration includes skills developed during completing coursework assignments. For example, in the management unit in year two and in financial accounting unit in year three, students were required to submit written assignments

in Word-processed documents and send them by e-mail to their tutors. This approach provided a context for students to enhance their skills in using word processing software, e-mail and the Internet to indirectly develop their skills. Another example is when the students were required to use PowerPoint in their presentation as in a management accounting unit year two.

Above are some examples of the direct and indirect approaches to integration. In general, the approach is based on individual initiatives and efforts rather than collective team efforts. Furthermore, the educators perceived that providing context for students to use IT is a way of developing the skills.

8.6.2 IT skills developed by students

Conception-based IT skills development is perceived to develop a range of IT skills, such as understanding general IT and organisational use of information systems (IS), the ability to use a word processor, the ability to use spreadsheet software, i.e. Excel, the ability to use database software, i.e. Access, the ability to use presentation software, i.e. PowerPoint, the ability to use Internet, the ability to use e-mail, and the ability to use specific financial software i.e. @Risk. Each will be explained in the sub-sections, beginning with an understanding of general IT and the organisational use of IS.

8.6.2.1 Understanding general IT and the organisational use of IS

Students were perceived to develop conceptual knowledge of general IT, including a few types of IS potentially used in organisations. This knowledge was introduced directly through one of the core units in the first year of the programme. The unit was a non-accounting unit, instead of a purely IT unit, which was also offered to students from all types of undergraduate programme. Thus, the coverage was very broad and general to allow for the different backgrounds of the students. Educators perceived it to be good foundation or background knowledge for students to further understand the use of more specific IT and IS within a more specific organisational context. However, the educators also thought that the content might be more relevant to other students, such as students in the management degree programme, compared with accounting students. From the students' point of view, they admitted that the coverage was quite general and basic and some of them were already familiar with the content of some of the lessons. Furthermore, the majority of the students perceived that it was not relevant and appreciated the lessons less. However,

practically, it was clear that there was a formal and structured approach attempting to develop a general conceptual knowledge of IT for students.

Beside this formal lesson, other educators expected students to grasp some ideas on the significant use of IT and IS in organisations through the use of IT in their coursework. For example, by using Excel in the cash budget preparation assignment and the capital investment appraisal modelling project in the management accounting units, students were expected to visualise the organisational use of Excel in management accounting activities.

8.6.2.2 Ability to use a word processor

Another skill perceived to be developed by students was the ability to use a word processor, specifically Microsoft Word. There was no formal, direct integration of word processing in teaching. However, most educators assumed that students knew how to use word processing software when they first came to university. Thus they strongly expected students to use a word processing package for their written assignments. It was observed that students used the application in completing coursework, either for the version to be submitted or during class preparation. All of the students, including first year students, identified this skill as one that they possessed at the time of the focus group. Most of them rated their skills in using word processor software as above average. So, students came to university with the ability to use the software. The ability was then further enhanced through some of the contexts provided in the degree programme.

8.6.2.3 Ability to use spreadsheet software

The next skill perceived to be developed was skill in using spreadsheet software, particularly Microsoft Excel. Excel is the most commonly used software in the programme (direct and indirect integration). In the first year, students were introduced to the basic operation of Excel, including creating a spreadsheet, using formulae, including 'what if' function, as well as financial functions such as Net Present Value and Internal Rate of Return.

Students were also introduced to some more advanced features of Excel, such as creating macros and embedding commands in buttons to be used in templates that would help less expert end-users to use Excel. These lessons were introduced as early as in the third year. Although there was no formal integration of Excel in the second year, students were expected to use it in preparing coursework. In the third

year, students were expected to further develop their skills in using Excel, based on the formal integration of using Excel and the Excel Solver package as a financial modelling tool in solving capital budgeting issues. Besides the formal integration, educators expected students to use Excel in dealing with other work that involved the use of a spreadsheet.

The students stated their ability to use Excel was a skill possessed at the time of the focus group (as with the word processor). They were also quite confident in using the software, rating their skills as average to above average. Some of them were already quite familiar with using Excel before coming to university. However, some students, especially from the alumni group, who had graduated in early 2000, admitted that their skill in using Excel improved while they were at university. They really appreciated the chance to use Excel in some units, as it provided a good foundation for them when entering the work place. Most students recalled the lesson on macros, although they did not see much benefit from it, but they had a good grasp of the topic. Basically, they developed and enhanced their skills in using Excel throughout their degree courses.

8.6.2.4 Ability to use database software, i.e. Access

The ability to use the Microsoft Access database software was perceived to be another skill developed by students during the programme. The programme included formal integration of Access in the IT unit, introduced as a core element in the first year programme. Besides conceptual discussions of database management, students were also given an opportunity to create and manage a database using Access in computer lab sessions. Differently from word processing and spreadsheet software use, most students did not have any skill in using database software prior to coming to university. Only two out of four first-year students as compared to all third-year students mentioned their ability to use Access at the time of the focus group. They considered the level of their skill in using Access as average to above average.

8.6.2.5 Ability to use presentation software i.e. PowerPoint

Conception-based IT skill development was also perceived to include skill in using presentation software, namely Microsoft PowerPoint. Although there was no formal teaching on using the software, some educators made the use of presentation software compulsory in presentation assignments. Most students used PowerPoint instead of other presentation software. Students had different levels of skill in using PowerPoint at the time they entered university. There was one student who

considered her level of skill as expert, and there was a student who rated his skill as less than average. In general, the students rated their skills as average to more than average. They agreed that learning within the university environment required them to do presentations, and, in doing them, they used computers as a medium of presentation. Most third year students felt comfortable with their skill in using PowerPoint. The alumni also agreed that they used PowerPoint a lot while in university. In general, the context provided in the programme helped them to enhance their PowerPoint skills.

8.6.2.6 Ability to use the Internet

Students were also perceived to develop skill in using the Internet. Most of the educators indirectly exposed students to use of the Internet by providing contexts for them to use it, such as searching for information either through the library database or other search engines. Some educators also required students to access online references by providing website addresses. Introducing a discussion board also encouraged students to use the Internet in order for them to join the discussion. Furthermore, students needed to use the Internet as a research tool to complete their two-semester dissertation unit. From the focus group, it was clear that most students had experience of using the Internet and considered it as a basic and common skill. In general, students considered their skill in using the Internet as more than average. They agreed that some coursework required them to use the Internet as a source of information. Educators also observed that students are increasingly citing information from web-based references. This showed that students were enhancing their skills in using the Internet as a research tool.

8.6.2.7 Ability to use e-mail

Furthermore, students were perceived as enhancing their skill in using electronic mail. Educators encouraged students to use electronic mail as a medium of communication by giving them their electronic mail address. There was also a unit in which students had to submit their coursework by mailing it electronically to the tutor. It was undeniable that students were familiar with electronic mail prior to coming to university. However, its use was more on an informal basis, in the sense that they were using it to communicate with friends and family. In the programme, they were using electronic mail to communicate with tutors and colleagues in a more formal situation.

8.6.2.8 Ability to use specific financial software, i.e. @Risk

Last but not least is the skill in using specific financial software, @Risk software in particular. The use of @risk software as a financial modelling tool was introduced in one of the core accounting units. Besides a conceptual discussion on the capability of the software in assisting users to make decisions related to investment appraisal, students were given the opportunity for hands-on experience using the software through IT-based lab activities. Thus, students were perceived to develop conceptual understanding of financial software for organisational use as well as practical skill in using commercial and industrial software.

8.6.3 Adequacy and pervasiveness of the integration

Another perceived outcome of conception-driven IT skills development was the issue of the adequacy and pervasiveness of the skills integrated in the programme. In terms of adequacy, the degree of integration was generally perceived as not adequate, according to both educators and students, including alumni. Most educators and students observed that there was increasing use of IT in terms of educational tools, such as the use of electronic Blackboards and IT-based lecture presentations within a certain group of educators, while there were others who were still not using such tools.

Some educators acknowledged the efforts of a few educators in employing IT in their teaching of academic concepts. However, they also expressed the view that there was still not enough integration of IT as a way of developing students' understanding and skills in an organisational context. They were convinced that educators should do more in that regard, including more frequent use of Excel. Furthermore, some of them expected to see the introduction and use of IT-based packages, such as accounting packages in financial accounting units, an auditing package in an auditing unit as well as a tax package in the taxation unit. None of these packages was integrated in any units in the programme. Thus, the integration of IT skills relating to accounting was not sufficient. However, educators felt a considerable number of contexts had been provided for the development of a basic level of general IT skills, such as in word processing and the Internet.

> *"For accounting there is also an issue of teaching IT as the skills that are asked for in professions such as accountancy and they are much more convinced and we are probably not doing enough."*
>
> [Accounting Educator D]

Educators and students looked at the pervasiveness of IT integration in the programme from two perspectives. One perspective was to look at how pervasive the integration was in accounting units. In terms of the use of IT as an educational tool, Blackboard in particular, appeared to be widely used across accounting units. There were some uses of a presentation package by some educators, while quite a number of educators preferred to use an overhead projector instead of a PowerPoint presentation. Only one accounting unit employed computer-based assessment as part of its evaluation method. In addition, two other core units evaluated their students' performance using computer-based assessment.

In terms of developing IT skills, the skills in using word processing and the Internet looked to be pervasive among the accounting units as well as in other core units. The other skills seemed to be concentrated in a few accounting units only. For example, the inclusion of IT packages relating to accounting or finance, such as Excel or a more specific package, such as @Risk, was only in a few accounting units. It was also observed that there was a less pervasive integration of the organisational use of IT in the programme.

Another perspective was to look at how widespread the integration was in the time span of the programme. It was observed that, in general, students had opportunities to use basic software progressively throughout the three-year programme. To illustrate this, students were using the Internet from year one to year three, as several units throughout the programme required students to do research. Students were given a context in which to use software, such as a word processor, presentation software or spreadsheet packages, in at least one of the units taught each year. However, overall integration seemed to be better in the first and third years of the programme, where many IT skills seemed to be developed directly within the units taught, specifically the understanding of general IT and the organisational use of information systems, the introduction of database management software (in the first-year unit), and the use of specific financial software (in the third-year unit).

The use of computer-based assessment was also more concentrated in the first-year units compared with other years. This was because of the nature of the units themselves, where the first-year units could be assessed through an objective type of question, compared with higher-level units, which were more appropriate for written and verbal types of assessment. In conclusion, there was continuation of particular IT skills development (such as Excel) throughout the time span of the programme, and

there were more IT skills besides the basic ones perceived to be developed in the first and third years of the programme. Some skills, such as skills related to using database software were only introduced once at the beginning of the first year without further enhancement in the later years of the programme.

8.6.4 Perceptions on gaps

There were several views as to whether gaps existed between the IT skills developed by graduates and the IT skills required for a career in accountancy. Some of the respondents, particularly educators, and surprisingly some employers and students, seemed unaware of the issue at all, since it was not an area of concern. The educators were more concerned about developing communication as well as analytical skills. Similarly, employers were looking for other learning skills such as leadership, communication and team spirit. However, some educators perceived gaps as being unavoidable, based on the different expectations of different parties. They felt that educators were concerned with conceptual understanding and academic excellence while students expected to be prepared for employment and employers were looking for both. Thus, they perceived that there would have to be some gaps. Some educators as well as students perceived that there might be a gap in that some skills or materials were insufficiently developed or ignored in the programme, such as accounting packages.

Quite a number of respondents from all groups had no idea as to whether the gap existed or not, because they did not have a clear idea regarding IT expectations in other groups. Indeed, educators had no idea what employers wanted in terms of the IT skills of graduates, and employers did not know what skills had been developed in higher education. Furthermore, the majority of students did not know the specific IT skills required by employers or what was expected to be developed in higher education. They just vaguely demanded more IT skills development in the accounting programme.

Although respondents assumed some degree of gap, they had no clear idea of what was missing. From the data, it seems that educators perceived the gap as existing in the area of understanding of the application of IT-based systems in business organisations. Another perceived gap was in the area of accounting packages, for instance financial accounting-related packages, auditing-related packages and computer-based systems for decision making, in terms of both the conceptual

knowledge of the packages and the hands-on experience of using the packages, which they expected and believed to be developed in higher education.

8.6.5 Potential future development

Last but not least, potential future development was also considered as one of the outcomes of the main phenomena of the conception-driven IT skills development. One of the perceived potential improvements was in terms of communication between school and employer as well as between school and support provider. Communication between educators and employers was perceived as clearing the blurred expectation of IT skills among them. Furthermore, educators considered that employers could provide potential support in terms of incentives to motivate educators to integrate IT and appropriate IT skill-based training to both educators and students.

Another potential improvement was related to the development of other skills, such as skills in using accounting and auditing packages, which seemed to be missing from the current programme. Such skills were perceived to be developed in alternative ways, such as through a single optional unit covering accounting packages or through existing accounting units by substituting some of the current class-based exercises with IT-package-based activities. The approaches seemed feasible considering the benefits of introducing the packages and the tight nature of the structure of the programme and the content of the unit.

The above illustrations starting from core phenomena in section 8.4, which influenced by the contextual conditions as illustrated in section 8.5, and the outcomes of the phenomena as explained in section 8.6 is diagramatised in Figure 8-1 below.

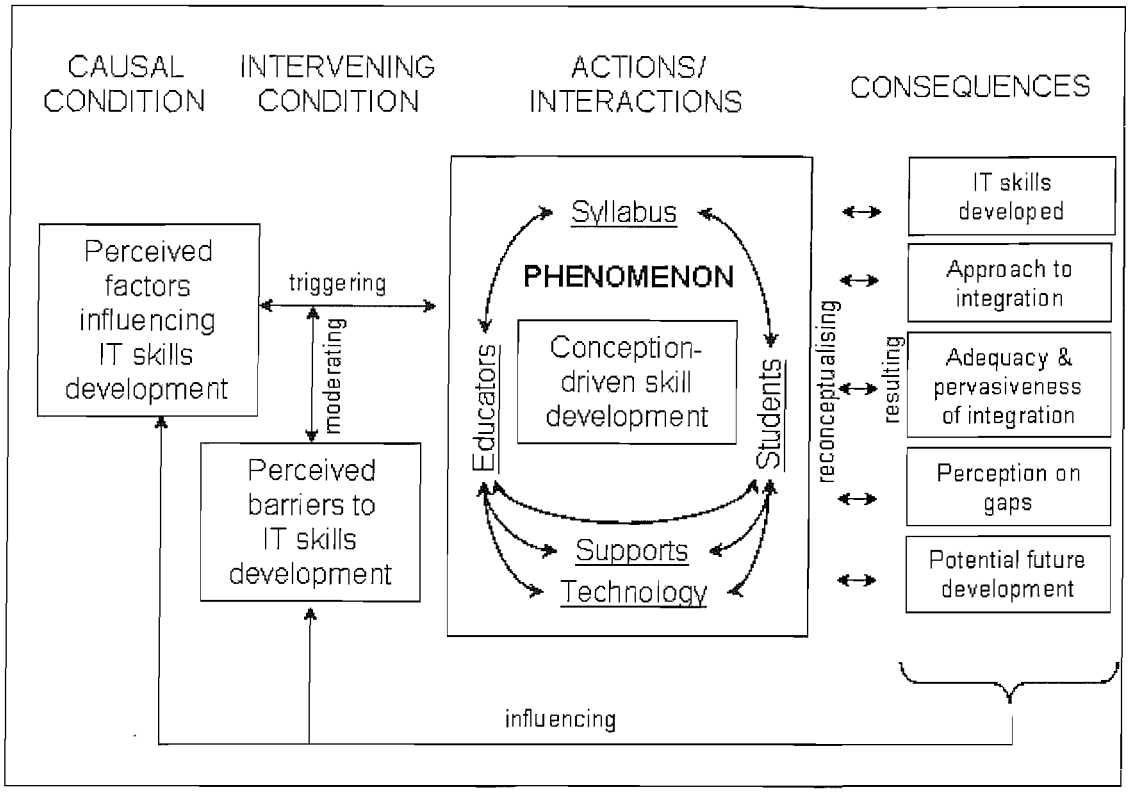


Figure 8-1 : Paradigm model of conception-based IT skills development

The 'perceived factors influencing IT skills development' causes the IT skills development initiatives. However, the 'perceived barriers to IT skills development' intervene the process to some extent prevent the educators to develop IT skills. For example, perception on employers' expectation on IT conversant-graduates causes the educators to think about integrating and developing IT skills through their teaching. However, some perceived factors such as lack of IT skills and knowledge and lack of support might moderate the educators' initial intention except for highly motivated educators. More to the point, the perception whether the factors are influential factors or barriers are depending on the way the educators conceptualise the issues. The conceptualisation will determine whether the IT skills are developed or not, the way it is developed and so on which considered as outputs of the conceptualisation process.

The double headed arrows show that the components are influencing each other. For example, the way the educators conceptualise the issues might influence their treatment on the issues, which can be the factors that direct the IT skills development or restraint the development. The conceptualisation influences the outputs and the outputs can also influence the conceptualisation (re-conceptualisation) process. For example, the skills developed resulted from the integration might causes educators to reconceptualise them in terms of the need for

further enhancement, which can also be perceived as influential factors. The output components also could turn back to the contextual conditions as either intervening or causal conditions, which then repeat the whole process.

8.7 Conclusion

This chapter has presented the core phenomenon of this research as identified in the selective coding process. The relationship among the categories and the evolving core category was clearly illustrated through a paradigm model of conception-driven IT skills development. The emerging substantive theory of the phenomenon of conception driven IT skills development in the accounting programme involves educators' conceptualisations on issues related to them, institutional cultures, responsibility for IT skills development, technology, syllabus, students, support and employers. Among the factors influencing the conceptualisation process included the interest and profile of educators, the availability of IT-based support, students' attitudes and expectations, type of university, university policy, other universities' IT practices, employers' expectations and accreditation as well as quality assurance reviews.

Consequently, the conceptualisation process, which contributes to different approaches to IT skills development, was seen to be able to develop several IT skills ranging from understanding and general use of IT and IS to the ability to use generic applications, such as the Internet and Microsoft Office as well as specific accounting software, particularly Excel and @Risk. However, the IT skills development was considered inadequate and not pervasive enough, since some of the relevant accounting IT related skills were not currently developed. Many suggestions were also identified to improve the situation, including integrating more IT skills relevant to accounting, hiring IT competent educators and establishing two way communication between educators and employers as well as educators and IT-based service providers. In conclusion, this research generates a substantive theory of conception-driven IT skills development approaches to explain the process of IT skills development in the undergraduate accounting degree programme studied in this research.

Chapter 9

The Emergent Substantive Theory in relation to the Extant Literature

9.1 Introduction

This chapter aims to position the substantive theory of 'conception-driven IT skills development' generated in this research within a wider theoretical discussion. Two major areas of the literature were identified. The theory will be compared with the literature on skills development in accounting programmes. Secondly, discussion will be based on the literature in the area of teacher planning, thinking, and decision making or teaching innovation.

9.2 Skills development in accounting literatures

Several issues emerged from the literature on skills development in accounting programmes as discussed in background to the research, Section 1.1 and Chapters 2 to 4. These issues are summarised in Figure 9-1.

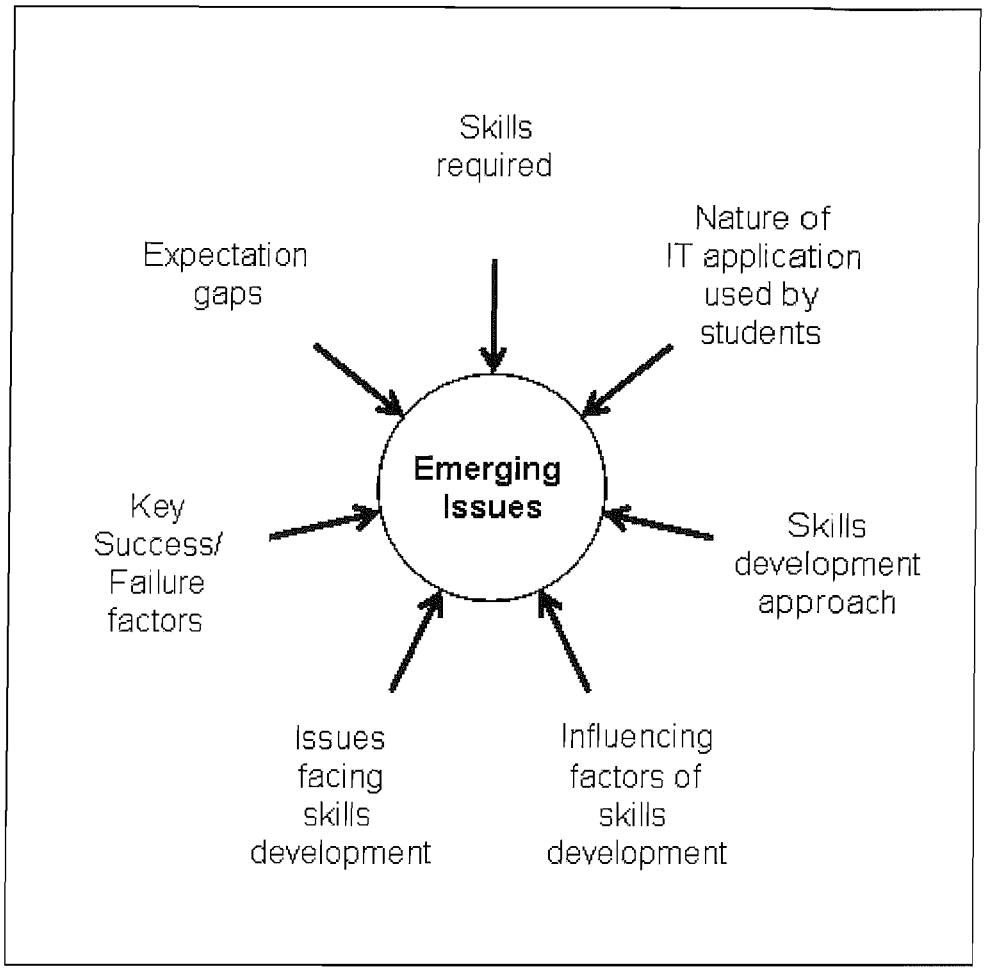


Figure 9-1 : Emerging Issues

These issues basically set the research objectives and research questions, as outlined in Chapters 1 and 5, and become the basis for the following discussion.

9.2.1 IT skills required or developed

Some IT skills development studies recognise that accounting students are expected to use spreadsheets, word processing, databases and accounting packages (Marriott 1992; Marriott and Mellett, 1994; Goldsworthy, 1996; Crawford and Barr, 1998; Marriott *et al.*, 1999; QAA, 2000a,b,c; Marriott *et al.*, 2003, 2004; Marriott, 2004). Marriott *et al.* (1999, 2003, 2004) also observed the use of statistical packages, e-mail and the Internet in addition to the above skills.

Some of the literature expresses the need to include expert systems (Sangster, 1991, 1994, 1995a; Sangster *et al.*, 1995) and the Internet (Sangster, 1995b;

Sangster and Mulligan, 1997), and they had demonstrated the use of the applications in the accounting curriculum. Students are also expected to have greater knowledge of computer applications, E-commerce and control and security issues (Goldsworthy, 1996; IFAC, 2003; Ahmed, 2003; Howieson, 2003). As the modern-day accountants work in a digital-based environment, involving consultancy and advisory tasks, other skills such as knowledge and skills on the roles of managers, designers and evaluators of information systems are also anticipated in accounting programme (IFAC, 2003; Ahmed, 2003).

This research observes that some recommended IT skills have been developed in the current accounting programme of the University investigated, as discussed in section 8.6.2. The programme is still far behind meeting the minimum requirement of suggested IT skill coverage in IEG 11 (IFAC, 2003). Neither does the programme even introduce students to any accounting packages even though most educators, students, alumni and employers expect a relevant accounting package, such as SAGE, and an auditing package to be introduced. They argue that the acquisition of knowledge and skills in one accounting package could be transferred when later using similar or even a different package (Marriot, 1992). Some educators felt that integration depends on the final opinion of the educator teaching the unit. Sangster (1992) concurs that: "Clearly, the final decision on whether to integrate IT into accounting courses rests with accounting academics" (p.15).

The literature considers IT skills to be important to gain employment in the accounting profession (Gammie *et al.*, 1995; Crawford and Barr, 1998; Howieson, 2003; IFAC, 2003, 2006). IT skill is ranked top (Bouchard, 2005) after communication skills (Gammie *et al.*, 1995). This research also recognises the importance of IT skills for a career in accountancy. However, employers stated that they were looking for other qualities, such as leadership skills, team spirit, and communication skills more than IT skills. Those skills are weighed up during recruitment, and employers expect graduates to have developed them in higher education. Respondents felt that they were not assessed in IT skills during the recruitment process (in job application forms or in interviews). They believed that IT skills could be developed later in job training.

Some accountant and audit trainees interviewed found that they could cope well with IT in their job, even if they had not previously had a strong background in IT. They were trained by their assigned mentors as well as through formal planned training on any IT skills that they needed. However, some employers including the alumni group

felt that some exposure to spreadsheets, presentation software and accounting packages during a degree programme was important.

9.2.2 IT application usage

The literature reveals that accounting students use IT packages, spreadsheets and the Internet mainly for course requirements. The increasing use of the Internet is supported by personal usage (Marriott *et al.*, 1999, 2003, 2004). In general, students have insufficient exposure to organisational and business use of applications, particularly to their powerful decision making capabilities (Albrecht and Sack, 2000). Some studies suggest that students should be expected to use IT packages on personal computers for business purposes to broaden their job opportunities (Gazely and Pybus, 1997; Crawford and Barr, 1999, Stoner, 1999, 2005; Albrecht and Sack, 2000; Marriott, 2004). This study reveals similar findings. Students mainly used technologies for educational and personal purposes, such as for entertainment. However, educators as well as students were aware of the importance of understanding the present and future organisational role of IT (AECC, 1990). Thus, they expected more context for IT integration from an organisational point of view on the courses, for instance the use of computer generated data for case study discussions and assignments.

9.2.3 Approaches: the way forwards

The literature raises an issue as to what is the best way to develop skills in an accounting programme (Morgan, 1999; Albrecht and Sack, 2000; Gammie *et al.*, 2002). Many studies (Crawford and Barr, 1997, and Gazely and Pybus, 1997) suggest that the holistic and integrated approach is the ideal way of incorporating skills in the accounting curriculum. This research shows that many educators were aware of the importance of IT skills development. However, the issue of how to integrate the skills becomes a hurdle. Only those who are really interested and motivated proceed with integration through creative initiatives and seeking help from technicians and information system support staff.

9.2.3.1 The holistic versus the individual unit approach

This research shows that an individual unit approach was taken instead off a holistic approach in integrating IT skills. Initiatives to include IT and develop IT skills to students were basically, based on the efforts and creativity of individual educators.

As a result, integration was concentrated at individual unit level with no continuation or reinforcement in the other units. These findings confirm similar findings in the literature (Marriott and Simon, 1990, Marriot, 1992, Marriott and Mellett, 1994, and Marriot, 1997, 2004).

The literature suggests that this approach has a negative effect on student attitudes toward computer learning (Marriott and Simon, 1990; Marriot, 1992; Marriott and Mellett, 1994; Marriot, 1997; Albrecht and Sack, 2000). Many second and third year students in this research commented that they had forgotten what they had been taught in previously and did not appreciate the time they had spent on learning the skills. However, some alumni expressed that they started to appreciate the skills acquired during their degree when they started work. They saw the benefit of it more once working. The study also showed that the use of IT in learning does not influence student performance in examinations. Only a few students opted to answer IT application related questions and only a few performed well. Marriott (1992) indicates that using IT applications does not influence students' test performances.

Although a holistic approach is argued to be an ideal way of embedding IT skills (Crawford and Barr, 1997; Gazely and Pybus, 1997), implementation is difficult. This is due to the need for cohesive collaboration and the involvement of all educators and support providers. Educators have different interests and perceptions on using IT in their teaching. In this research, some educators felt that development of IT skills was outside of their interest and responsibility, and preferred to leave it to others. As a result, only those interested in IT put effort into integrating IT into their teaching, so that the ideal way was unsustainable.

9.2.3.2 Other approaches

Another suggestion raised by a few students was to have industrial training as a way of developing IT skills during the degree. Some educators objected that a substantial amount of work required to find placement for a large number of students, but students at School of Engineering Science were given that opportunity. In their experience, a good relationship between school and industry is helpful. The accounting literature suggests a need for collaboration between employer and academics, to fill the gaps in academic content and learning skills development (Theuri and Gunn, 1998; Chang and Hwang, 2003; Ahmed, 2003). This research also found a need and observed preparedness among educators to cooperate with

accounting professionals. However, employers, especially high ranking ones, showed a lack of interest or less willingness to commit themselves, due to their busy schedules.

9.2.4 Factors influencing IT skills development

Previous studies on IT skills integration indicate several factors that enable IT skills development initiatives. The two main factors that spur efforts are an intention to improve graduate employability and to gain benefits from using IT as an educational tool (Sangster, 1992; Marriot, 1992; 1994; Marriott and Mellett, 1994; Sangster, 1995a, 1995b; Sangster and Mulligan, 1997; Marriot, 2004). The two influential factors are revealed in this study too. The study also shows that there are educators that incorporate IT in their teaching to create an exciting and enjoyable learning environment, as expressed by Marriott (2004, p.56) as "an enjoyable, challenging and rewarding learning experience". This research also highlights some factors beyond direct school control, such as university policy, other university's integration experience, quality assurance reviews and professional course accreditation, which have some influence on IT skills development initiatives. More to the point, the substantive theory also reflects that personal interest and motivation of educators as the strongest factors influencing the implementation of IT skills development in the course.

9.2.5 Issues facing the implementation of IT skills integration

Some previous studies have identified several barriers to integration. Among the barriers are lack of incentive and institutional support (Long and MacGregor, 1996; Baker and White Jr., 1999; Albrecht and Sack, 2000; Allen, 2000), individual institutions (Marriot,1999), an aging faculty and members of staff (Sangster, 1992; Albrecht and Sack, 2000), reliance on old methods (Sangster, 1992; Kelly *et al.*, 1999; Albrecht and Sack, 2000), and an overcrowded accounting academic programme (Long and MacGregor, 1996; Baker and White Jr., 1999; Allen,2000). Albrecht and Sack (2000) also indicate lack of business interaction, a rapidly changing pace in the business environment and technology, and lack of direct interaction with industry as other barriers to integrating IT in education. In addition, Sangster (1992) raises issues of conflicting demands on staff time, limited knowledge of practical aspects of accounting and IT, and a lack of knowledge on what materials

are available. Limited resources are also identified as preventing educators from incorporating IT into teaching (Gazely and Pybus, 1997).

This research has observed that some of the issues above include lack of incentives and institutional support, type of institution, tight programme structure, time pressure and limited resources in terms of technical and physical support as barriers in the IT skill development process. Some educators in this research also identified a few other environmental issues that prevent IT skills development in the accounting degree programme, for instance the very academic nature of accounting and the rapidly changing nature of the syllabus content, particularly in the unit relating to accounting standards. Besides those barriers relating to academic staff (such as lack of knowledge on what skills to develop and what packages are relevant and available on the market, as well as the age profile of academic staff as found in the existing literature), other attitudes of educators (lack of interest, fear of technology and leaving to others to do) were found to be barriers as well in this research.

Stoner and Milner (2006) reveal that students' dependencies on 'instrumental and shallow learning strategy' as well as a vague picture of the work environment complicate skills development. This research also identifies other issues, related to students, which prevent educators to integrate IT in their teaching. Among the issues are the assumptions that students already possess the skills or lack of interest. These issues about students have not been identified before. Moreover, this research has discovered that some students did not much favour relying on using on-line learning, such as the electronic discussion board or web-based learning materials, as they might lose benefits deriving from a face to face learning environment as found by Marriott *et al.* (2004). They appreciated the productiveness and efficiency of the approach (having learning materials on-line or on computer slides), yet expressed their preference for the old methods, such as face-to-face discussion, rather than using the electronic discussion board. Generally, they accepted the Internet as an educational support tool, but not totally to replace the traditional learning environment.

> *"I think there is [a] danger as well [in putting teaching material on the Internet]. From a personal view you don't need to go to the lecture room. I would hate that, I really would [Another Student: get your lectures over the Internet] I don't mind having our course materials on [the] Internet. But as far as teaching and*

everything else, it does need someone there and you need to be there as a learner"

[Accounting Student Y3_V]

Despite several factors identified as barriers to integration, the emergent grounded theory suggests that the conception made by educators on the issues causes them to perceive particular issues as barriers or not. For example, as regards the issues about resources, some educators found that in terms of physical facilities, such as hardware and technical support, for example technical advice and assistance, they are sufficient and do not become a barrier at all for them. Moreover, some including educators from School of Education and School of Engineering Science felt that the IT facilities provided by the university is far advanced compared to some other institutions. In contrast, some educators claimed that there is a lack of physical IT resources as well as difficulties in obtaining technical support, which finally prevents them from integrating IT in their teaching.

In conclusion, grounded theory suggests that the inclusion of IT in teaching and IT skills development is greatly dependent on the choice of educators.

9.2.6 Critical success/failure factors in implementation

Some key success factors have been identified in the existing literature. For instance IFAC (1995b) discovered that policy makers and cost commitments, right application choices in terms of compatibility with existing facilities and closeness to a real business applications, prior knowledge and skills preparation for students, joining forces between subject and IT experts and involvement of all in assessment processes, are factors that bring success to IT integration. Other key success factors found in the literature are appropriate skills development (IFAC, 1995b; Lyons, 1998), academic department involvement in university strategic planning (Lyons, 1997), clear communication between educators, support providers and students (IFAC, 1995b; Aisbitt and Sangster, 2005), an integrated and realistic approach (IFAC, 1995b; Gazely and Pybus, 1997), educators positive attitudes towards IT skills development (Gazely and Pybus,1997) and appreciation of the whole benefits of IT, not only cost savings (Lyons,1997) or time savings (Sangster, 1992).

The grounded theory in this study adds to the literature by suggesting the need for a catalyst among educators and the business school to move forward and show exemplary integration. On top of that, highly IT interested and motivated educators

are perceived as central to successful implementation of IT skills development in accounting programme.

9.2.7 Expectation gaps between the accounting profession and education (IT skills)

Many studies show insufficient coverage in several areas of knowledge, including taxation (Miller and Woods, 2002), quantitative methods in management accounting (Francis and Minchington, 1999) and personal skills development, for example communication and team work (Morgan, 1999; Arquero *et al.*, 2001, 2004). The existing research also demonstrates that employers prefer graduates from new universities compared to traditional universities despite the wide coverage of subject knowledge in the traditional universities curricula (Miller and Woods, 2002). Moreover, the new universities put more efforts in developing learning and vocational skills along with subject knowledge, compared to traditional universities (Morgan, 1999; Marriott *et al.*, 1999). The substantive theory indicates that the same situation exists, where almost all educators highlighted a distinctive feature of traditional universities, which focus on academic issues. Furthermore, they acknowledge the role of educators in the new institutions, which emphasise vocational skills.

The emergent substantive theory also proposes that the issue of gaps exists because of unclear communication and expectations among stakeholders on required skills. Most educators said that they did not know what employers exactly wanted and they felt that employers were unclear and diverse in their requirements. Moreover, students were also unclear about the working environment. They just blankly asked for any skills that would equip them for job. Despite that, they did not appreciate the skills offered in the programme, due to inability to see a connection with their future working environment. Furthermore, although the study revealed some efforts on the part of employers to reach students, no direct or formal established relationship exists between educators and employers. As a result, there is no clear communication on the expectations between educators and employers. Academics put into practice what they think is correct, based on their perceptions. On the other hand, educators from School of Engineering Science saw less of a problem on the issue of the expectation gap, as a result of greater involvement of industry in their programme, for example, the representation of industry on an advisory board and support made through an industrial training programme for students. Thus, the emergent grounded theory acknowledges the needs for good communication among

all stakeholders, including students, teachers and employers to convey the expectations and needs of every party.

9.3 Conception-driven IT skills development and other education research

On further review of the literature (refer to 4.3) on other field of education, a more related theory to the emergent grounded theory of 'conception-driven IT skills development' is found that relates to teachers' thinking, planning, making decision and taking action, which shape the learning and teaching practice. This literature is briefly reviewed in Section 4.3. The closeness of theories in this area of research with the substantive theory emerging from this research causes the researcher to consider them in discussing and placing the substantive theory within the extant literature of education in general.

The literature shows that several factors have either made innovation successful or failures (Hannan, 2005; Wopereis *et al.*, 2005; Whitworth, 2005). Most studies find that the involvement of all stakeholders and clear communication between all related parties are major factors influencing successful innovation in teaching and learning. Among the stakeholders, educators are found to be the main actors (Clark and Yinger, 1987; Wilson *et al.*, 1987; Borko and Shavelson, 1990; Senge, 1990; Schommer, 1990; Moallem, 1996; Howard *et al.*, 2000; Windschitl and Sahl, 2002; Yero, 2002, Churchill, 2006; Eley, 2006; Tondeur, *et al.*, 2006; Haydn and Barton, 2007). Several factors, such as teachers' knowledge, teachers' belief about teaching and learning, influence their thinking, planning and decision making. The studies also suggest that intervention might help to change the teachers' conception of the required teaching innovation (Moallem, 1996; Churchill, 2006).

This study has also discovered a number of issues related to several areas that influence educators to integrate and develop IT skills in their teaching. Some of the areas such as teachers, students, learning and technology are largely in accordance with the findings of other studies (Borko and Shavelson, 1990; Schommer, 1990; Moallem, 1998; Howard et al, 2000; Windschitl and Sahl, 2002; Churchill, 2005). In particular, the study reveals the perceptions of teachers on responsibilities for skills development, employers, technical and knowledge support, institutional culture and syllabus as additional issues that influence educators in considering IT skills development in their teaching process. In the area of students, the issues of

students' prior IT skills and students' participation in IT-based activities were mostly raised by teachers as compared to students' ability, background and demographic profiles, as discussed in existing research (Borko and Shavelson, 1990; Schommer, 1990; Moallem, 1998; Windschitl and Sahl, 2002; Churchill, 2006).

There are research that shows there is one area considered the most important for teachers in their instructional planning and technological integration (Borko and Shavelson, 1990; Schommer 1990, Howard *et al.*, 2000). Borko and Shavelson (1990) suggest that students are the greatest concern in the teachers' instructional planning. Howard *et al.* (2000) and Schommer (1990) highlight epistemology as the most significant issue influencing the instructional design and practice. On the other hand, Moallem (1998) treats all private theory as evenly significant. Similar findings to Moallem (1998) are revealed in this research. However, this study suggests that each area of private theory has its own weight and together they form a synergic effect that influences educators in making decisions on IT skills development in their teaching. It also acknowledges that different educators have different private theories (Churchill, 2005) with different emphases. Nevertheless, the data shows that most educators perceived issues related to teachers as the strongest influential factor in determining IT skills integration in their teaching. The issues include the personal interests and motivations of educators, on teaching innovation includes IT integration, as well as age profile, knowledge of educators on IT related skills and suitable applications to use, availability of packages on the market and the skills to use them.

9.4 Conclusion

This chapter has integrated the emergent grounded theory of 'conception-driven IT skills development' in the existing literature, skills development in accounting education in particular and teaching innovation in general. The emergent grounded theory proposes that educators are the key figures driving the initiatives to develop IT skills in teaching. This is consistent with the finding of other studies, as illustrated in the following statements:

"Clearly, the final decision on whether to integrate IT into accounting courses rests with accounting academics"

(Sangster, 1992, p.15)

"The power to change education - for better of worse - is and always has been in the hands of teachers"

(Yero, 2002, p.3)

The substantive grounded theory also suggests that the educators' personal beliefs on issues related to themselves as teachers, issues related to institutional culture, employers, students, support, syllabus and perceptions on responsibilities determine the decisions on IT skills development in teaching. This is largely in accordance with the findings that teachers develop and hold private theories that influence their teaching practice as well as technological integration (Borko and Shavelson, 1990; Schommer, 1990; Moallem, 1998; Howard *et al.*, 2000; Windschitl and Sahl, 2002; Churchill, 2005). In conclusion, this chapter has outlined the substantive grounded theory within the relevant extant literature to promote a greater understanding in a wider theoretical perspective. The next chapter presents the conclusions and contributions of this research.

Chapter 10

Conclusions and Contributions

10.1 Introduction

This chapter provides the final conclusion to this research and its contributions. It begins with a section summarising the research and its key findings. The next section discusses key contributions in relation to theories, methodologies and practices. It then followed by the reflections on the application of grounded theory methodology. The chapter draws to an end with suggestions for future research.

10.2 Summary of the research, key findings and reflection of research questions

10.2.1 Summary of the research

This research has explored the process of IT skills development in accounting degrees in a UK university through a grounded theory methodology. Data was collected through multiple qualitative approaches, including interviews, focus groups, observations and document reviews, focusing on respondents from one traditional university in the UK and one big accounting firm. For a more rigorous comparative analysis, the data sources were extended to education and engineering programmes. Using grounded theory procedures (Strauss and Corbin, 1990, 1998), the research is aimed to generate a theory substantive to the data collected related to the phenomena.

10.2.2 Key findings

This research has revealed an emergent substantive theory of 'conception-driven IT skills development'. It proposes that IT skills development in teaching is driven by the perceptions of educators on issues related to educators, institutional values, responsibilities for skills development, support, learning, technology and students. The theory also suggests that educators' 'private theories' on issues related to teachers is predominantly emphasised by most educators, which influence their private theories in other areas. It advocates that educators with a 'positive private theory', particularly on educator-related issues (such as those educators, who had a

high interest in IT and possessed experience in using IT in teaching) have demonstrated efforts in IT skills development through integration in teaching practice.

The research has acknowledged some basic IT skills development; including skills in using a word processor, spreadsheets, presentation software, e-mail and the Internet in the accounting programme investigated. A skill in using specific financial software, @Risk, was also covered. Despite this, many respondents, including educators and students, considered the development of skills to be insufficient and concentrated in just a few units. Furthermore, the skills required in using accounting, tax and auditing-related software are yet missing in the programme, which suggests that a gap still exists. The reasons for the gap emerged to be unclear expectations and communication lacking among stakeholders in accounting education. It is additionally explained by the nature of educators' private theory.

10.2.3 Reflection on the research questions

Overall, this research has achieved its objective, which attempts to understand the process of developing and enhancing students' IT skills through the research questions outlined earlier in sections 1.2 and 5.8

For the first question about what are the IT skills required for accountants from practitioners', educators' and students' perspectives, this research has discovered that there are similar expectation about IT skills that should be developed by graduates. Among the skills are ability to use productivity software including word processing, spreadsheets, presentation software, communication software and accounting related software such as ledger software, auditing and tax related packages. In general, students are looking for any skills that would enhance their employability skills. Educators also suggest a more exposure on developing students' understanding on organisational role of IT. Meanwhile, some practitioners also emphasise on other learning skills such as personal motivation, leadership, team work and communication skills.

The second question is about the factors influencing the development of IT skills in the undergraduate accounting programme. This research has revealed some influential factors, which can be categorised as external and internal factors of influence as discussed in section 8.5.1. It suggests that the internal factors such as aim to enhance students' learning process through the use of IT and educators'

personal motivation and interest are more influential compared to external factors such as employers' expectations and professional accreditation. Personal motivation and interest of educators on IT are considered as the most influential factor.

The research has also disclosed the IT skills developed in the current programme and how they are develop as described in sections 6.7.3, 8.6.1 and 8.6.2 thus answering the third research question.

There are some issues identified facing the implementation of the skills development. Besides the influential factors that trigger the development initiatives, there are factors that moderate the initiative. These moderating factors are discussed in section 6.9 and 8.5.2 thus answering the fourth research question on issues facing the implementation of IT skills integration in accounting programmes.

Finally, the question of the critical success/failure factors of the implementation. The research suggests that educators' personal motivation and interest are the most influential factor, which influences them in conceptualising related issues about teaching priority, skills development, students and employers' expectations, supports and role of IT in teaching and learning. This is thoroughly discussed in section 8.4, which concludes that the way they conceptualise the issues determines whether the issues are considered as factors of influences or barriers to the IT skills development process. Thus, educators are the key success/failure factors in the implementation process.

The next section highlights the contributions of this research.

10.3 Contribution of the research

This research has made several contributions to current theory, methodology and practice as discussed in the following sections.

10.3.1 Theoretical contribution

This study has identified a grounded theory of 'conception-driven IT skills development' as the central explanation of the process of developing IT skills in the UK higher education context.

The findings and discussion in this study can potentially add to existing knowledge on skill development in particular and educational innovation in general as well as teacher thinking and decision making processes.

First, this study provides additional evidence on various findings regarding education reform. These include the findings on insufficient IT skills development in accounting programmes (Albrecht and Sach, 2000; Chang and Hwang, 2003; Ahmed, 2003; Lin *et al.*, 2005), basic IT skills development for graduates (Marriott 1992, 1994; Goldsworthy, 1996; Crawford and Barr, 1998; Marriott *et al.*, 1999,2003; Marriott, 2004; Marriott *et al.*, 2004), individual initiatives and innovation (Sangster, 1992), key success and failure factors in educational innovation (Sangster, 1992; IFAC, 1995b; Gazely and Pybus, 1997; Lyons, 1998; Sangster, 2005) and educators as a key enabler in teaching innovation (Sangster, 1992; Yero, 2002).

Secondly, it also extends some of the existing findings in a few areas. For example, it gives evidence on a more advanced IT skill development, such as in @Risk software in the accounting programme. Another extension is in terms of additional factors influencing the initiatives for skill development, including the emphasis given to university policy, the practices of other institutions, quality assurance processes, accreditation issues and the nature of the accounting syllabus. Besides that, the knowledge, skill and personal interest of educators is proposed to be the strongest influential factor enabling or inhibiting changes in instructional practice. The study also suggests that vague skill requirements and lack of communication among stakeholders (between educators and employers as well as among educators themselves) as two main reasons for the existence of skill expectation gaps. Furthermore, it adds a few more issues and areas of teachers' private theory, including perceptions on responsibilities for skills development as well as perceptions related to employers.

Thirdly, this research proposes a substantive theory. Theory is defined as "a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena" (Strauss and Corbin, 1998, p.15). This study suggests a link between educators' conception and teaching innovation. As the label 'substantive' indicates, this theory is based on the specific research setting of this study. Thus, it is close to the real-world situation. Although the results of the study cannot be generalised beyond the substantive population, it can inspire schools in a similar contexts.

Last but not least, the substantive theory can be a basis for further theoretical investigation towards establishing a more formal theory. It could be further explored with other established theories, such as organizational change theory and educational theory.

10.3.2 Methodological contribution

In terms of methodological approach, most of the studies reviewed in the literature are informed by quantitative approaches, based on survey data. Thus, this study contributes to the existing literature by explaining the issue from the interpretive approach of grounded theory study in detail. Besides identifying the skills developing as well as missing in the programme, which is similar to some quantitative studies, the in-depth investigation in this study of the phenomena making a major difference concluded by discovering that the conceptions made by educators are the main issue concerning the development of IT skills in the accounting programme.

This thesis also provides another example of using grounded theory methodology research. It offers detailed procedures for carrying out the research as well as recording the outputs. This supplements the existing grounded theory approach documentations to increase understanding and variation of the approach. The central point is the procedure outlined by Strauss and Corbin (1990, 1998), which are only guidelines not be followed strictly. Letting the process flow naturally to stimulate a rigorous and vigorous analytical process helps to capture important aspects of data and achieve a complete explanation of the phenomena. Moreover, each of the analytical tools and techniques has its own applicability relative to the context.

This thesis extensively used the paradigm model as a basis for capturing the dynamic flow of the data and the complex nature of their relationships. The model was enhanced particularly in terms of the position of the components and the two-headed arrows linking them to emphasise the mutual relationships among the categories. In addition, memos and diagrams were primarily and widely used as record keeping techniques throughout the research process and became important sources of reference in writing the thesis, to the extent that most of them form substantial parts of the data analysis and discussion chapters of the thesis. This thesis presents the result of the research in the form of a paradigm model and narrative description. The explanation begins with core phenomena, followed by the conditions promoting and mediating the occurrence of the core phenomena and

finally the consequences of the phenomena. This help to describe the story naturally and smoothly in the context of the research.

10.3.3 Practical contribution

In terms of practical contribution, this study provides several potential implications, firstly, on policy making in teaching innovation, which should focus on educators as the key drivers of innovation. The educators should be coached to mould their private theories directly to IT skills development in their teaching. Training (Howard *et al.*, 2000) and intervention strategies via reflective activities (Moallem, 1998 and Churchill, 2006) would change teachers' beliefs. Initiatives to boost interest and enhance knowledge as well as skills of educators should be considered as they were proposed as the strongest factors enabling IT skills development in teaching. University policy should put emphasis on teaching innovation to be followed by schools and departments. Of equal importance to teaching, learning and research should be encouraged in terms of policy as well as practice. Incentive schemes should acknowledge teaching and learning innovation.

Secondly, information on potential areas for development, such as on skills in using accounting and auditing software and organisational understanding of IT applications should be considered, to enhance skills development in current programmes. All stakeholders in educations, including teachers, potential employers and students should identify their skills needs and clearly communicate their expectations. Thus, policy makers should provide a platform to promote communication.

10.4 Reflection on the application of grounded theory methodology

Grounded theory emphasises no theoretical foundation prior to the research. The theory emerges from the data and is substantiated in the particular research setting. The emergent theory could be a newly proposed theory or an explanation of existing theory. This research has demonstrated the generation of substantive grounded theory through the rigorous and systematic analytical guidelines of Strauss and Corbin (1990, 1998). The thesis did not aim at generating a formal theory. However, it has provided further thoughts on it in the extant literature on the substantive area and beyond to promote a basis for potential development of formal theory in the long run.

The difficulties in conducting interpretive research have been acknowledged throughout the research process. The data collection was iteratively performed with data analysis and continued until no additional data was noted. The data were gathered using focus groups, interviews, observations and document reviews. The first three methods required substantial time spent before and after the events. In terms of the focus group, there are many advantages and disadvantages. It was difficult to gather all participants because of their different schedules and commitments, which ended up in lower attendance than expected. Although the focus group sessions were recorded, sometimes it was difficult to transcribe them because of the poor quality of the recording output, due to a large room and unfamiliar participants. The notes taken during the session and the reflection made after the session helped reduce the problems. Another alternative employed to accommodate the issue as well as to verify the data was through individual contact.

It was felt that one to one interviews were more practical than the focus group. Although it was sometimes difficult to access the respondents and get their approval, identifying the right respondents helped to overcome that. Once the key persons were identified, those respondents could extend the relevant data. The interviews also offered more in-depth data compared to the focus group. In contrast, the focus group offered a rich comparative data sources.

The qualitative data were also difficult to analyse and document, to a certain extent disturbing the flow of the research process. The process became easier when the analytical procedures and tools (grounded theory) were adopted flexibly, creatively and naturally. For example, using the analytical tool, termed 'paradigm' was very effective in the process of linking the various categories and discovering their complex relationships, which naturally led to the generation of the emergent substantive theory. Consequently, the paradigm model was developed. The combination of the model with narrative description helped to present the proposed emergent grounded theory of conception-driven IT skills development.

The separate coding procedures are theoretically recognized yet practically difficult to distinguish during the actual process. They were conducted simultaneously and iteratively. Thus, it was also difficult to document the three analytical processes and outputs separately. This thesis has tried to present them separately in three chapters, Chapter 6 to Chapter 8. The Chapter 6 discusses the process and output of open coding. The Chapter 7 discusses the process of axial coding and just summarise the

main output of the process, main categories. The detailed explanation of each of the main categories and their relationships is presented in Chapter 8, with the presentation of selective coding's output, core phenomena. Besides avoiding redundancy of explanation, this approach helps to give a complete understanding of the research story and clear meaning of the categories since the categories derived parts of their meaning from their relationships with other categories and particularly, core phenomenon.

In general, writing a grounded theory research is difficult since most of the analytical process occurred as a 'mental dialogue' which is spontaneous, natural and sometimes unaware and unrecorded. Thus, this thesis basically documents major distinctive parts of the whole complex process of the grounded theory research.

The outcomes of the analysis were consistently validated by comparing them with the raw data. Thus, the transcripts of the focus groups and interviews were frequently revisited to make sure the analytical product fit the actual data. The outcomes also disseminated to some respondents for their comments and feedbacks on how far it meet their cases in a broader sense.

Discussions with colleagues were among a significant technique in conducting grounded theory research. The discussions and debates promote analytical thinking as well as validate the theoretical thoughts.

After all, grounded theory research is complex since it is trying at conceptualise the meaning of social process from the perspectives of participants. Keeping this in mind will ensure the theory is generated from the data.

10.5 Limitations of study and suggestions for future research

This study has some limitations, which provide several implications for future research in educational reform in terms of IT skills development, other skills development and teaching innovation in accounting programme as well as other educational programme. First, this study generates substantive grounded theory. However, it is suggested that grounded theory research should extend within the established theory to form a new formal theory. Thus, future research should consider discussing this emergent theory within existing theories such as educational and instructional theories to promote a more formal theory generation.

Second, the emergent grounded theory explains the phenomena of skills development in this research setting, which focus solely on a single university as a case study. Thus, its generality is limited. Thus, future research could generalise the theory by considering other setting such as other university educational programme, other potential employers to the extent, other higher institutions in other countries to promote general theory on the phenomena.

Third, the emergent grounded theory proposes possible relationships between teachers' belief and IT skills development. However, this study does not testify the proposal. Thus, future research could test the conceptual hypothesis.

Fourth, this research has explored some areas of teachers' private theory for this particular group of educators. Thus, research could extend to other educators from different type of universities and explore other areas of private theories. In addition, future research could explore the possible links between other areas of private theories and IT skills development in teaching

In conclusion, future research could further develop this context-specific generated theory to form a general theory on the phenomena.

Appendix A
Dearing Report

Some of the recommendations of Dearing (1997) regarding ICT that noteworthy to mention are:

Recommendation 9: "We are recommend to all institutions should, over the medium term, ensure that staff and *students receive appropriate training* and *support to enable them to realise its (Communication* and *Information Technology) full potential"*

Recommendation 14: "...immediately establish a professional Institute of Learning and *Teaching in Higher Education. The functions ... to stimulate innovation."*

Recommendation 15: "... develop, ... a system of kite marking to:

- Identify good computer-based learning materials;
- Coordinate the national development, over the medium and long term, of computer-based learning materials;
- Manage initiatives to develop such materials; facilitate discussion between all relevant interest groups on promoting the development of computer-based materials to provide common units or modules, particularly for the early undergraduate years."

Recommendation 17:"...their admission procedures should develop to value good levels of competence in communication, numeracy and *the practical use of information technology."*

Recommendation 21:"...begin immediately to develop...a 'programme specification' which identifies potential stopping-off points and *gives the intended outcomes of the programme in terms of:*

- The knowledge and understanding that a student will be expected to have upon completion;
- Key skills:...the use of information technology and learning how to learn..."

Recommendation 41: "...all higher education institutions in the UK should have in place overarching communications and *information strategies by 1999/2000"*

- Under the recommendation, it expects students use their own portable computers as a means of access to information and for learning via a network. It also aware that students will need access to high quality networked desktop computers that permit the use of the latest multi-media teaching materials and other applications.

Recommendation 46:"...by 2000/01 higher education institutions should ensure that all students have open access to a Networked Desktop Computer and expect that by 2005/06 all students will be required to have access to their own portable computer.

Appendix B

Subject benchmarking statements

Subject-specific knowledge and skills	Cognitive abilities and non-subject specific skills
• An understanding of some of the contexts in which accounting can be seen as operating (examples of contexts include the legal and social environment; the accounting profession etc) • Knowledge and understanding of the main current technical language and practices of accounting (example, recognition, measurement and disclosure in financial statements) • Knowledge and understanding of some of the alternative technical languages and practices of accounting (example, alternative recognition rules and valuation bases) • Skills in recording and summarising transactions and other economic events; preparation of financial statements; analysis of the operations of business (for example, decision analysis); financial analysis and projections (for example, analysis of financial ratios) • Knowledge and understanding of contemporary theories and empirical evidence concerning accounting in at least one of its contexts (for example, accounting and capital markets) and the ability to critically evaluate such theories and evidence • Knowledge and understanding of theories and empirical evidence concerning financial management, risk and the operation of capital markets.	• A capacity for the critical evaluation of arguments and evidence • An ability to analyse and draw reasoned conclusions concerning structured and, to a more limited extent, unstructured problems and from a given set of data and from data which must be acquired by the student • Ability to locate, extract and analyse data from multiple sources, including the acknowledgement and referencing of sources • Capacities for independent and self-managed learning • Numeracy skills, including the ability to manipulate financial and other numerical data and to appreciate statistical concepts at an appropriate level • Skills in the use of communications and information technology (C and IT) in acquiring, analysing and communicating information (currently these skills include the use of spreadsheets, word processing software, on-line databases) • Communication skills including the ability to present quantitative and qualitative information, together with analysis, argument and commentary, in a form appropriate to the intended audience • Normally, ability to work in groups, and other inter-personal skills, including oral as well as written presentation skills
Source: Adopted from QAA (2000a)	

Knowledge, abilities and skills covered upon completion of a degree

Appendix C

BSc Accounting and Finance - Module

Programme Objectives:

By the end of the programme, students will be able to:

- Understand and interpret financial and managerial information.
- Generate accounting information relevant to internal and external users
- Appreciate the contexts in which financial and managerial information is gathered and used.
- Comprehend, apply and critically evaluate current and possible alternative accounting practice.
- Understand the theory and practice of investment and finance.
- Show awareness of a range of theoretical and methodological perspectives adopted within accounting and finance research.

Degree Regulations:

Tern		1999/2000, 2000/2001, 2001/2002		2002/3		2003/4 - 2005/6
Yr	Sem.	Code	Name			
1	1	AM101	Financial Accounting 1			MANG1001
		AM103	Introduction to Management			MANG1003
		EC105 / 107	Quantitative Methods Depending on A level Maths	AM109	Management Analysis	MANG1007
		EC101 / 103	Economics Depending on A level Economics			ECON1001 / ECON1003
	2	AM102	Management Information 1			MANG1002
		EC106 / 108	Quantitative Methods EC105 & EC106 are paired EC107 & EC108 are paired	AM108	Information systems & Information Technology	MANG1006
		Option	Students who took EC101 must take EC102 Students who took EC103 must take EC104 or 1 unit from AM or EC list			ECON 1002 / ECON 1009
		Option	One unit from Social Science list or Language Unit			

Tern		1999/2000, 2000/2001, 2001/2002		2002/3		2003/4 - 2005/6
Yr	Sem.	Code	Name			
2	1	AM203	Financial Accounting 2			MANG2003
		AM205	Law for Accountants	AM235	Commercial Law	MANG2016
		EC221	Applied Microeconomics 2	AM233	Financial Management	MANG2015
		Option	1 unit from AM, Social Sciences list or Double/Single Language unit	AM201	Organisations & Management	MANG2001
	2	AM204	Portfolio Theory & Corporate Finance			MANG2004
		AM206	Management Information II	AM206	Management Accounting	MANG2005
		AM214	International Banking	AM210	Management Research	MANG2008
		Option	1 unit from AM, Social Sciences list or Double Language unit	AM236	Company Law	MANG2017

Tern		1999/2000, 2000/2001, 2001/2002		2002/3	2003/4 - 2005/6
Yr	Sem.	Code	Name		
3	1	AM303	Financial Accounting 3		MANG3003
		Option Option	2 units from AM309, AM310, AM316, AM317, AM320, AM332, EC371.	No fewer than 3 units from AM314, AM316, AM317, AM320, AM332, AM338	Add to option list: MANG3029(AM337) MANG 3030(AM340)
		Option	Project (AM398/399, 2 units) or Contemporary Problems (AM390, 1 unit)	Project (AM398/399, 2 units)	Project MANG3025 (2 units)
	2	Option			
		Option	3 units from AM (including SS361 & ST304), EC, Social Sciences List or Double/Single Language unit.	No more than 1 unit from the AM, EC or permitted Social Sciences List	No more than 1 unit from the MANG or Language lists
		Option	1 unit from AM List (including SS361 & ST304) if Contemporary Problems chosen		
				AM309 Advanced Management Accounting	MANG3006

Subject Codes Listing:

Code	Area	Name
AM309/ MANG 3006	Accounting & Management Science	Advanced Management Accounting
AM310		Advanced Accounting Theory
AM314		International Banking
AM316		Tax Policy
AM317		International Business Finance and Accounting
AM320		Auditing
AM332		Future and Options
AM337/ MANG3029		
AM338/MANG3021		Corporate Governance
AM340 /MANG3030		
EC101/ EC1001	Economics	Foundations of Microeconomics
EC102		Foundations of Macroeconomics
EC103		Principles of Microeconomics
EC104		Applied Economics and the British Economics
EC105		Intro to Maths for Economics
EC106		Intro to Statistics for Economics
EC107		Statistics for Economics
EC108		Mathematics for Economics
EC371		
SS361	Sociology & Social Administration	Human Resource Management
ST304	Social Statistics	Market Research Methods

Appendix D

Exemptions from Professional Examinations

<table>
<tr><td></td><td colspan="2">2000</td><td>2001</td><td colspan="2">2002</td><td>2003</td><td colspan="2">2004</td><td>2005</td><td>2007</td></tr>
<tr><td></td><td colspan="2">As at April</td><td colspan="2">As at April 2002</td><td colspan="3">March 2004</td><td>May</td></tr>
<tr><td>ICAEW:
Exempted</td><td colspan="10">Commercial Law & Company Law (double or single exemptions)</td></tr>
<tr><td rowspan="6">Can make a case for exemption</td><td colspan="9" rowspan="2">Business and management</td><td>Professional Stage:</td></tr>
<tr><td>Business & Finance:</td></tr>
<tr><td colspan="9">Management Information (MAI)</td><td rowspan="3">FA1/MAI/M/ FA3/MA3 & ECON 1009/1001/ 1003</td></tr>
<tr><td colspan="9">Introduction to Management (M)</td></tr>
<tr><td colspan="9">Organisations & Management (O&M)</td></tr>
<tr><td colspan="9" rowspan="2">Management Accounting 1 (MA2)</td><td>Accounting (FA 1 / 2)</td></tr>
<tr><td>Management Information (FA1/MA2)</td></tr>
<tr><td rowspan="5">ICAS</td><td rowspan="5">Foundation stage</td><td colspan="7">Some / all of the 5 papers of the test of competence</td><td>Case by case basis</td></tr>
<tr><td colspan="7">Financial Accounting (FA)</td><td>Must complete a FA module in each of the 3 years</td></tr>
<tr><td colspan="7" rowspan="2">Business Management & Finance</td><td>Complete Finance units in both 2nd & 3rd year & Economics unit.</td></tr>
<tr><td>Complete Management Accounting modules in 2 years.</td></tr>
<tr><td colspan="7">Business Law (if both Commercial Law & Company Law are taken)</td><td>No subject requirement (but syllabus coverage must be achieved)</td></tr>
<tr><td colspan="7">Principle of Auditing & Reporting</td><td>Complete with 60%+ marks</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">2000 2001</td><td colspan="2">2002 2003</td><td colspan="2">2004 2005</td><td>2007</td></tr>
<tr><td></td><td colspan="2">As at April</td><td colspan="2">As at April 2002</td><td colspan="2">March 2004</td><td>May</td></tr>
<tr><td>ACCA:</td><td rowspan="12" colspan="2">Foundation stage</td><td colspan="4"></td><td></td></tr>
<tr><td rowspan="2">Exempted</td><td colspan="4">All part 1 examinations</td><td>Accountant in Business</td></tr>
<tr><td colspan="4">Papers part II (depending on choice of units taken)</td><td>Management Accounting</td></tr>
<tr><td rowspan="4">Not exempted</td><td colspan="4">Tax Policy (Business Taxation)</td><td>Financial Accounting</td></tr>
<tr><td colspan="4" rowspan="3">Auditing (Audit & Internal Review)</td><td>Corporate & Business Law</td></tr>
<tr><td>Performance Management</td></tr>
<tr><td>Financial Management</td></tr>
<tr><td>CIMA</td><td colspan="4"></td><td></td></tr>
<tr><td rowspan="8">Exempted</td><td colspan="4">All foundation examinations</td><td rowspan="8">Certificate in Business Accounting (access degree & transcript)</td></tr>
<tr><td colspan="4">Papers at Intermediate levels:</td></tr>
<tr><td colspan="4">Finance</td></tr>
<tr><td colspan="4">Financial Accounting</td></tr>
<tr><td colspan="4">Financial Reporting</td></tr>
<tr><td colspan="4">Management Accounting – Performance Management</td></tr>
<tr><td colspan="4">Management Accounting – Decision Making</td></tr>
<tr><td colspan="4">Organisational Management paper (If Human Resource Management paper is also taken)</td></tr>
<tr><td>CIPFA</td><td colspan="5">Students need to apply individually</td></tr>
<tr><td>AIA</td><td colspan="5" rowspan="4"></td><td>Foundation Level papers</td></tr>
<tr><td>Professional Level 1 papers:</td></tr>
<tr><td>Company Law</td></tr>
<tr><td>Business and management</td></tr>
<tr><td>Management Accounting</td></tr>
</table>

As at April 2000 to April 2001, the School of Management was still in the process of applying for relevant exemptions in respect of its degree programme.

Appendix E

Sample access letter

Respondent name and address

Date

Dear

Subject: PhD Research

My name is Rosmila Senik, a postgraduate student at School of Management, University of Southampton. I am conducting a research on understanding the process of enhancing information technology (IT) knowledge, skills and competencies for accounting graduates to prepare them for a career in accountancy, under supervision of Dr Martin Broad and Professor Andrew Goddard.

As part of the research, I am seeking to understand the issue from the perspective of the employer. I hope the research area will be of some interest to you (Name of firm) and I believe your experience as one of the big four accounting companies and UK top graduate employer, would be of great help for me to understand the skills requirements of accounting graduates.

In particular, I am interested to find out the following issues:

- perception on recruitment criteria
- perception on accounting degree programme
- perception on competencies of accounting graduates
- perception on IT skills development in the accounting degree programme

For this reason, I would like to kindly request an appointment with you or anybody whom you think appropriate for an hour interview at your convenience. The interview will be recorded for analyzing purposes but confidentiality is assured. I am happy

also to discuss any feedback and provide my overall findings to you. If this is fine with you, I would be grateful if you could suggest the time for the interview.

Thank you for your time and consideration, and looking forward to hear from you.

With Kind Regards

Rosmila Senik
Post Graduate Research (PGR) Student
School of Management
University of Southampton
Highfield, SO17 1BJ
United Kingdom
e-mail: rosmila@soton.ac.uk

Appendix F

Ethics Review Checklist

Project Title: Understanding Information Technology Skills Development in Accounting Programme: a Grounded Theory Study

Researcher(s): ROSMILA SENIK

Funder: The Faculty of Economics and Management, University Putra Malaysia (UPM) and the Ministry of Higher Education, Malaysia.

Part One

Does your research involve any of the following?

	YES	NO
1. Interviews	*	
2. Questionnaires/Surveys		*
3. Analysis of personal details (e.g. bank records, personnel or admin records, test results etc.) that are not already in the public domain (e.g. published in a book)		*

If you have answered 'NO' to all of the above then your research does not need any further ethical consideration. If you answered 'YES' to any question then please continue on to Part Two and Three below.

Part Two

	YES	NO
Does the study involve participants who are particularly vulnerable or unable to give informed consent? (eg children, adults with special difficulties etc)		*
Will the study require the co-operation of an advocate for initial access to the groups or individuals? (eg children, people with disabilities, adults with a dementia etc)		*
Could the research induce psychological stress or anxiety, cause harm or have negative consequences for the participants (beyond the risks encountered in their normal lifestyles)?		*
Will deception of participants be necessary during the study? (eg covert observation of people)?		*
Will the study involve discussion of topics which the participants would find sensitive (eg sexual activity, drug use)?		*
Will financial inducements (other than reasonable expenses or compensation for time) be offered to participants?		*
Are there problems with participants' right to remain anonymous, or to have the information they give not identifiable as theirs?		*
Is there any way the participants might be unaware of their right to freely withdraw from the study at any time?		*
Will the study involve recruitment of patients or staff through the NHS?		*
Does the study involve any sort of confidential data that may need to be destroyed at the end of the study?		*

Part Three

For each item answered 'YES' in Part Two, please give a summary of the issue and action to be taken to address it. Please continue on a separate sheet if necessary

Signed: Date:

(Principal Investigator)

To be completed by the Chair of the Ethics Committee

☐ Appropriate action taken to maintain ethical standards – no further action necessary

☐ The issues require the guidance of the School's Ethics Committee

COMMENTS:

Signed:

Date:

Appendix G

Focus group: Introduction and ground rules

Time spend on the small talk:_____ mins

Time start: _____ Time end:_____

Welcome:

Good morning, and welcome to our session today.

Thank you for taking the time to come and join our discussion on accounting degree programme.

Introduce team members:

My name is Rosmila, post graduate research students. I am researching on IT skills integration in accounting programme under supervision of Dr Martin Broad and Prof. Andrew Goddard. Assisting me in this session is Gaspar. He will play a role as time keeper and note taker.

Overview of the topic-why they are here

You were invited in this discussion because we are particularly interested in your experience and views on accounting degree programme especially after having through 2 years of this programme.

Before we begin, let me suggest some guidelines that will make our discussion more productive.

Guidelines/Ground rules

This is a discussion session.

My role here is to ask questions and listen.

I won't be participating in the conversation, but we want you to feel free to talk to one another, (not directed to me)

share your experience and point of view whether they are in positive comments or negative comments.

It is important for us to hear from each of you because you have different views or opinions.

Tape recording

We are tape recording the session because we don't want to miss any of your comments.

You may be assured of confidentially since we do not use names in the report.

To avoid garbling the tape, please allow one person to talk at a time

We have placed name cards on the table in front of you to help us remember each other's names

Let's begin.

Opening question

Tell your name, where do you come from and what are the most exciting accounting units learnt so far.

Appendix H

Focus Group: Sample questions

3rd Year: 1st Session

Categories of questions	Questions	Time Total =90	
Opening	Tell your name, where do you come from and what the most exciting event during the summer break.	5	
Introductory	**Q1**.Describe what do you understand with the term IT skills.	5	
Transition	**Q2.**Write down on the paper provided, any IT skills that you think you currently posses.	5	
	You are asking to rate your skills based on a 5-point Likert scale, where 1 is considered very little and 5 is considered expert. Please indicate your skill level on the scale for each of the skills identified. Which IT applications have you used and how do you use them?	5	
	Q3. What are your views on the importance of IT skills for a working career in accountancy?	5	
Key	**Q4**.In your opinion, what IT skills do you think are required to prepare you for a career in accountancy?	5	
	Q5. What is your perception at this point in time regarding your accounting education? Is it that you expect to learning accounting techniques in isolation or that accounting techniques will be learnt in combination with IT skills?	5	
	Q6. When you think of IT skills integration in accounting education, what comes to mind?	5	
	Q7. Think back to the units you have already studied in the accounting programme for the pass two years, what IT skills do you think have been developed in them?	10	
	Q8. Tell us by giving examples, what IT skills have been developed and how have they been integrated in the previous units studied?	15	

Categories of questions	Questions	Time Total =90	
	Q9. In your opinion, which of these approaches have helped you develop these skills most effectively?	5	
	Q10. How do you think the IT skills could have been developed differently, i.e. better or more effectively?	5	
	Q11. What other IT skills do you think could have been developed in the units studied?	5	
	Q12. What IT skills do you expect to gain from the remaining units on the accounting programme to the completion of the degree?	5	
	How do you think the skills should be developed effectively in this programme?	5	
Ending	We are trying to understand the process of integrating IT in UG accounting programme to prepare students for working in a modern accounting environment, where IT skills will be essential. As students, what do you think the accounting programme should do to help you achieve this?	5	

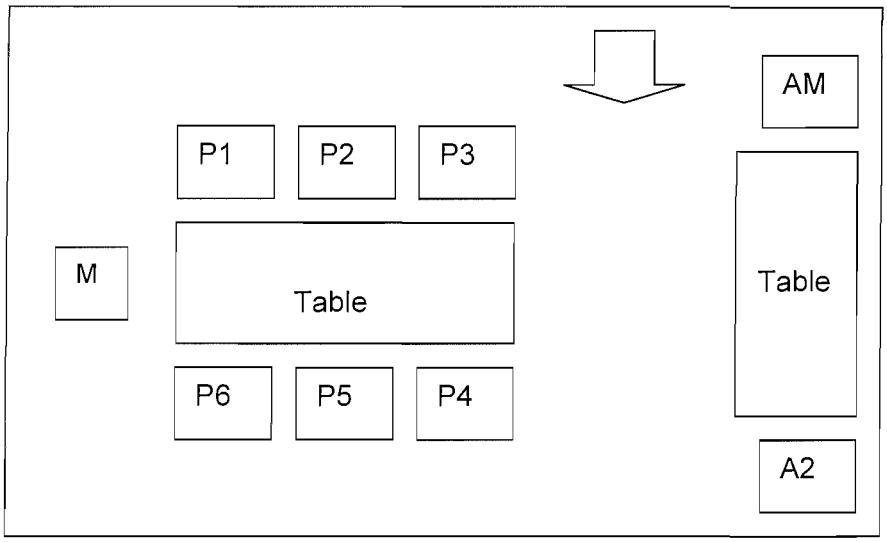
Appendix I

Focus Group: Reporting form

Reporting Form

Focus Group	Year 3	
Date	25/10/2004	
Starting time:		
Ending time:		
Venue	Building 2/Room3062	
Moderator (M)	Rosmila Senik	
Assistant Moderator (AM)	Abeid Francis Gaspar	
Assistant (A)		
Participants:	**Code**	**Attendance** *(Thick if they are present)*
Name list of participants	P	
	P	
	P	
	P	
	P	
	P	

Seating Layout:



The way participants' response to the questions	Understanding on the question:
• Knowledgeable (**K**) • Confident (**C**) • Unsure (**US**) • Quiet (**Q**) • Active (**A**) • Interested (**I**) • Neutral (**N**)	• Ask for more clarification (**MC**) • Not understand (**NU**) • Not clear (**NC**) • Understand (**U**) • Need to rephrase (**R**)

Responses to Questions Q1:

Describe what do you understand with the term IT skills.

Objective of the question:

- To know students' understanding/background knowledge on IT

Time spends on the question: 5 mins Time asks: _____Time end: _____

Key points

Skills / Computers / Software / Hardware / information / multimedia/ decision making / communication/ internet / e-mail / technology / know how... / understanding on .../

	Brief Summary/Key points/participants responses	Notable Quotes	Body language	interest
P1				
P2				
P3				
P4				
P5				
P6				

Assistant Moderators Comments/Observations

Appendix J

Sample interview question

Main Research question:

What are **educators'** points of view with regard to the integration of the Information Technology skills in undergraduate accounting programme?

Note: Term skills used in reference to all type of skills including conceptual knowledge, practical knowledge/skill or combination of both which appropriately termed competencies. So the terms skill, knowledge and competencies are interchangeably used.

Tentative questions:

1. What is your opinion regarding developing IT skills in undergraduates accounting programmes?

2. What is your view about the coverage of IT skills on the accounting degree now?

3. In the context of integrating IT skills in accounting degree programme, how do you think this can be undertaken?

4. What are IT skills (if any) aimed to be developed in your unit(s) and how do you develop them through the unit(s)?

Referring to Q4, if there is IT skill aimed to be developed ...., then proceed to Q5. Otherwise proceed to Section B.

5. What are your objectives in integrating IT in your units?

6. What are the motivating factors in incorporating IT in your unit(s)?

7. What issues do you encounter in developing IT skills in your unit?

8. What support is given/should be given by the school to encourage the initiatives to integrate IT skills in the unit(s)

9. Is there any other party/parties do you think could help or encourage this effort. If yes, please name it and explain what types of support you think applicable.

10. In your opinion, what IT skills could be developed in your unit(s) and how it can be developed? What are the hurdles preventing you from doing that?

11. Do you think that a gap exists between what the students currently learn in their Accounting degree and what accountants require in the real world, with regard to IT skills?

12. if yes,
    a. What are the components of that gap?
    b. What do you think the reasons for the gap?
    c. What do you think can be done to bridge the gap?

13. If no, what is your opinion that the literature suggest a gap exist between what the students currently learn in Accounting degree and what accountants require in the real world, with regard to IT skills?

    Then questions 12a, 12b, 12c, 14 and **15**

14. To what extent do you think the Accounting degree equips students with IT skills for the real world, after graduation?

15. What future developments in integrating IT skills in the Accounting degree would you suggest?

Section B:

1. In your opinion, what IT skills could be developed in your unit(s) and how it can be developed? What are the hurdles preventing you from doing that?

2. What would be your objectives to integrate IT skills in your unit(s)?

3. What factors can motivate the effort to incorporate IT skills in your unit(s)?

4. What issues do you think will be encountered in the process of developing IT skills in your unit(s)?

5. What support is given/should be given by the school to encourage the initiatives to integrate IT skills in the unit(s)

6. Is there any other party/parties do you think could help / encourage this effort. If yes, please name it/them and explain what types of support you think applicable or necessary.

7. Do you think that a gap exists between what the students currently learn in their Accounting degree and what accountants require in the real world, with regard to IT skills?

8. if yes,
   a. What are the components of that gap?
   b. What do you think the reasons for the gap?
   c. What do you think can be done to bridge the gap?

9. if no, What is your opinion that the literature suggest a gap exist between what the students currently learn in Accounting degree and what accountants require in the real world, with regard to IT skills?

   Then questions 8, 8b, 8c, 10 and **11.**

10. To what extent do you think the Accounting degree equips students with IT skills for the real world, after graduation?

11. What future developments in integrating IT skills in the Accounting degree would you suggest?

Appendix K
Grounded Theory Terminology

The following terminologies, arranged in alphabetical order, are adapted from Strauss and Corbin (1998).

Analytic tools: Devices and techniques used by analysts to facilitate the coding process (p.87)

Asking questions: An analytic device used to open up the line of inquiry and direct theoretical sampling (p.73)

Axial coding: The process of relating categories to their subcategories, termed "axial" because coding occurs around the axis of a category, linking categories at the level of properties and dimensions (p.123)

Categories: Concepts that stand for phenomena (p.101)

Central category: Sometimes called the core category, represents the main theme of the research. Although the central category evolves from the research, it too is an abstraction. In an exaggerated sense, it consists of all the products of analysis condensed into a few words that seem to explain what 'the research is all about" (p.146)

Coding: The analytic processes through which data are fractured, conceptualized, and integrated to form theory (p.3)

Concepts: The building blocks of theory (p.101)

Conditional/consequential matrix: An analytic device to stimulate analyst's thinking about the relationship between macro and micro conditions/consequences both to each other and to process (p.181)

Diagrams: Visual evidence that depict the relationship among concepts (p.217)

Dimensions: The range along which general properties of a category vary, giving specification to a category and variation to the theory (p.101)

Making theoretical comparisons: An analytic tool used to stimulate thinking about properties and dimensions of categories (p.78)

Memos: The researcher's record of analysis, thoughts, interpretations, questions, and directions for further data collection (p.110)

Methodology: A way of thinking about and studying social reality (p.3)

Methods: A set of procedures and techniques for gathering and analyzing data (p.3)

Microanalysis: The detailed line-by-line analysis necessary at the beginning of a study to generate initial categories (with their properties and dimensions) and to suggest relationships among categories; a combination of open and axial coding (p. 57)

Macro conditions/consequences: Those that are broad in scope and possible impact (p. 181)

Micro conditions/consequences: Those that are narrow in scope and possible impact (p. 181)

Open coding: The analytic process trough which concepts are identified and their properties and dimensions are discovered in data (p. 101)

Phenomena: Central ideas in the data represented as concepts (p. 110)

Process: Sequences of action/interaction pertaining to a phenomenon as they evolve over time (p. 123)

Properties: Characteristics of a category, the delineation of which defines and gives it meaning (p. 101)

Range of variability: The degree to which a concept varies dimensionally along its properties, with *variation* being built into the theory by sampling for diversity and ranges of properties (p. 143)

Research problem: The general or substantive area of focus for the research (p. 35).

Research question: The specific query to be addressed by this research that sets the parameters of the project and suggests the methods to be used for data gathering and analysis (p. 35)

Selective Coding: The process of integrating and refining the theory (p. 143)

Sensitivity: The ability to respond to the subtle nuances of, and cues to, meanings in data (p. 35)

Structure: The conditional context in which a category (phenomenon) is situated (p. 123)

Subcategories: Concepts that pertain to a category, giving it further clarification and specification (p. 101)

Technical literature: Reports of research studies and theoretical or philosophical papers characteristic of professional and disciplinary writing that can serve as background materials against which one compares findings from actual data (p. 35)

Theoretical comparison: An analytic tool used to stimulate thinking about properties and dimensions of categories (p. 73)

Theoretical sampling: Data gathering driven by concepts derived from the evolving theory and based on the concept of 'making comparisons,' whose purpose is to go to places, people, or events that will maximize opportunities to discover variations

among concepts and to identify categories in terms of their properties and dimensions (p. 201)

Theoretical saturation: The point in category development at which no new properties, dimensions, or relationships emerge during analysis (p. 143)

Theory: A set of well-developed concepts related trough statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena (p. 15)

The paradigm: An analytic tool devised to help analysts integrate structure with process.

Appendix L

Open Category

Concepts	Category	Subcategory
• Assumption on IT used in practice • Expectation on IT skilled recruit • Importance of IT skills development • IT skills expected • IT skills required in career • IT usage in job • Reason for development • Stand for IT skills development	1. Attitudes towards IT skills development	• Importance • Preferable skills • reasons
• Develop through university's courses • Development through ISS • Industrial training • On job training • Student's initiative • Student's self development	2. Responsibilities for IT skills development	Responsibility of • Students • employers • educators • student support centre
• Approach • Assumption on IT used in practice • Balanced right • Blackboard • CBL • Expectation on IT skilled recruit • Integration experience • IT as a teaching tool • IT skill development • IT skills expected • IT skills required in career • IT usage in job	3. Respondents' understanding of 'IT skills integration'	• Educational technology • Required IT Skills development

Concepts	Category	Subcategory
• As a mean to an end • Assumption on IT used in practice • Expectation on IT skilled recruit • Integration experience • IT skills expected • IT skills required in career • IT usage in job • Objective	4. Objective of integration	• Reinforcing students' learning process • Creating a different learning environment • Developing one of the skills required by accounting profession • Time saving • Manage limited resources

• Approach
• Approach_ IT in non accounting unit
• Approach_ IT related to accounting unit
• Approach_IT in accounting unit
• Approach_IT unit
• Assessment
• Balanced right
• Blackboard
• Book with IT-based supplementary material
• CBL
• Coverage in USEE
• Incentive to student
• Indirect integration
• Integration experience
• IT as a teaching tool
• IT skill development
• Providing context
• Students_Time application
• Supplementary material
	5. Approach to integration	• IT in accounting units
		• Accounting related IT units
		• Educational tool used in teaching
		• IT skill development in teaching
		• Formal integration
		  • IT based class activities
		  • IT based course assignment
		• Informal integration
		  • Student's self initiative
		  • Context provided
		• Assessment

Concepts	Category	Subcategory
• Academic staff interest • Activity rank order • Age profile • Barrier • Blackboard_negative feedback • Lack of knowledge • Personal motivation • Problem • Rapidly changing subject area • Students attitude • Students' participation • Time pressure	6. Perceived barriers to IT skills integration	• Tight syllabus structure • The very academic and rapidly changing nature of the subject area • Staff interest and skills • Identifying IT skills and the right application • Time pressure to complete syllabus • Time pressure - activity rank order/rewarding activity • Age profile • Cost barrier • Student attitudes • Educator attitudes • Support • Assumption about students' IT skills
• Integration experience • Problem • Student's attitude • Support • Support_access • Time implication • Weaknesses	7. Problem of integration	• Problem related to physical IT resources • Problem related to human resources • Problem related to accessibility to material • Problem related to time • Student attitudes
• Academic staff interest • Catalyst • Driving factors • Accounting demonstrator	8. Driving factors	• Catalyst • Unit coordinator • Highly motivated and interested educator in IT
• Conceptual understanding vs. IT skill • Determinant factors • Priority_understanding principle	9. Determinant factors	• Enhanced learning process

Concepts	Category	Subcategory
• Motivational factor • Personal motivation • Students' time application • Students' feedback	10. Motivational factors	• Personal motivation/interest • An exciting and enjoyable teaching and learning environment • Time Saving
• Assumption on IT used in practice • Expectation on IT skilled recruit • IT skills expected • IT skills questionnaire • IT skills required in career • IT usage in job	11. Expected IT skills to develop	• Financial accounting package • Auditing and tax packages • Management accounting-related applications • Excel

• IT skill possessed
• IT usage experience
• Prerequisite skills
	12. IT skill possessed (at university entry level)	• General IT Skill
		• Skill in using specific package
		  • Word processor
		  • Spreadsheet
		  • Databases
		  • Internet and e-mail
		  • presentation software
		• Conception of skills possessed by students

Concepts	Category	Subcategory
• Approach • Coverage in USEE • Integration experience • Skill developed@Risk • Skill developed_database • Skill developed_E-mail • Skill developed_Excel • Skill developed_general exposure • Skill developed_Internet • Skill developed_knowledge on organizational use of IS • Skill developed_Statistical package • Skill developed_Word • Skills developed • University preparation	13. IT skills integration experience	• Financial and Accounting Units • Management Units • IT and IS units
• 1st year integration • 2nd year integration • 3rd year integration • Approach_IT in accounting unit • University preparation • Widespread	14. Widespread of Integration	• How widespread in accounting unit? • How widespread in the time span of the programme?
• Adequacy • Integration experience • Lack in coverage • University preparation	15. Adequacy of Integration	Enough or not?

• Accounting demonstrator
• Land T coordinator
• Support
• Support_access
• Support_CLT
• Support_colleague
• Support_employer
• Support_ISS
	16. Support	• Skill-based support
		  • Learning and Teaching coordinator
		  • CLT
		  • Catalyst
		  • Expertise / demonstrator
		• IT-based facility support
		  • ISS
		• Employer support
		• Institutional support

Concepts	Category	Subcategory
• External influences • University policy	17. External influences factors	• Employers • Professional accounting bodies • Quality Assurance Agency • Other universities • University policy
• Accounting package • AIS • Arguments for and against accounting package • Arguments on accounting package • Auditing package • Components of gap • Gap • Missing skill • On job training • Perception on accounting package • Skills suggested • Tax package • University preparation	18. Perception on gap	• The awareness of the existence of the gap • Arguments for the existence • Perceived area of the gap
• All background • Competencies • Selection criteria • Working experience	19. Selection Criteria for graduates recruitment	• Academic background • Core competencies • Related working experience

Concepts	Category	Subcategory
• Accounting demonstrator • Accounting package • Accounting demonstrator • AIS • Approach suggested • Arguments on accounting package • Auditing package • Double session for IT • Future development • Missing skill • Perception on accounting package • Report writing • Skill level suggested for accounting package - generic • Skills suggested • Students_time implication • Suggestion • Support • Support_access • Support_CLT • Support_colleague • Support_employer • Support_ISS • Tax package • University preparation • What can be improved	20. Suggestion for improvement	Suggested skills • Understanding of IT application in organisational context • Accounting packages • Auditing and tax packages • Management related applications • Excel Suggested approach • Employer involvement • IT based context • Time allocation for IT based class activity • Potential unit for integration Support • Accounting IT moderator • Improve communication between school and employer • Improve communication between school and support provider • Skill-based training

Appendix M

Main Category

Open Category	Main Category	Subcategory	Explanation
• Attitudes towards IT skills development • Determinant factors • Driving factors • Expected IT skills to develop • External influence factors • Motivating factors • Support	1. Perceived factors influencing IT skills development	• The perceived external factors of influence	• Employers • Professional accounting bodies • Quality Assurance Agency • Other universities • University policy

		• The perceived internal factors of influence	• Determinant factors
			  • Value added to learning process
			  • Enhance conceptual understanding
			• Motivational factors
			  • Highly interested educator
			  • Fulfilling Student's expectation
			  • Availability of IT-based support
			  • Advantages of IT employment in teaching

Open Category	Main Category	Subcategory	Explanation
• IT skills possessed • Perceived barriers to IT skills integration • Problem of integration • Responsibilities for IT skills development • Support	2. Perceived barriers to IT skills development	• Academic staff-based barrier	• Personal interest • Skill • Knowledge • Age profile
		• Environmental-based barrier	• Type of university • Syllabus constraint • Time Pressure • Cost
		• Student based-barrier	• Student's participation • Perceived skill possessed by student
• Approach to integration • Approach to integration • Objective of integration • Respondents' understanding of 'IT skills integration' • Responsibilities for IT skills development • Support	3. IT skills development approach	• Approach to development	• Educational tool used in teaching • IT skill development in teaching • Student self development • Development through ISS

		• Formality of integration	• Formal Integration approach
			  • IT based class activities
			  • IT based course assignment
			• Informal integration approach
			  • Student's self initiative

		• Enforcement instruments	• Assessment • Incentive

Open Category	Main Category	Subcategory	Explanation
• Objective of integration • Respondents' understanding of 'IT skills integration' • Expected IT skills to develop • IT skills integration experience	4. IT skills developed	• Type of skills	• understanding general IT and organisational use of information systems (IS) • the ability to use a word processor • the ability to use spreadsheet software, i.e. Excel • the ability to use database software, i.e. Access • the ability to use presentation software, i.e. PowerPoint • the ability to use Internet • the ability to use e-mail • the ability to use specific financial software i.e. @risk
• Widespread of Integration • Adequacy of integration • IT skills integration experience	5. Widespread and adequacy of IT skills development	• How widespread in accounting unit? • How widespread in the time span of the programme?	

Open Category	Main Category	Subcategory	Explanation
• Perception on gap • Widespread of Integration • Adequacy of integration • IT skills integration experience • Perceived IT skills expected • IT skills developed • Selection Criteria for graduates recruitment • Suggestions for improvement	6. Perception on gap	• The awareness of the existence of the gap • Arguments for the existence • Perceived area of the gap	
• Suggestions for improvement • Perception on gap • Support • Expected IT skills to be developed	7. Potential future development	• Potential skills to be developed	• Understanding use of IT in organisational context • Accounting packages • Auditing packages • Tax packages

		• Potential improvement in approach	• Improve communication
			  • School and employer
			  • School and support provider
			• Skill-based training
			• Potential approach
			  • Alternative ways to develop
			  • Time allocation for IT based class activity
			  • Potential unit for integration

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