



UNIVERSITI PUTRA MALAYSIA

**INFLUENCE OF ICT-SUPPORTED LEARNING ENVIRONMENT
PERCEPTIONS, ACADEMIC ABILITY, AND PRIOR EDUCATIONAL
EXPERIENCE ON STUDENTS' APPROACHES TO LEARNING
PRINCIPLES OF ACCOUNTING IN MALAYSIAN SECONDARY
SCHOOLS**

TAN BOON SEE

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By

TAN BOON SEE

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the
Degree of Doctor of Philosophy**

January 2017

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DEDICATION

To our children,

To the future



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

INFLUENCE OF ICT-SUPPORTED LEARNING ENVIRONMENT PERCEPTIONS, ACADEMIC ABILITY, AND PRIOR EDUCATIONAL EXPERIENCE ON STUDENTS' APPROACHES TO LEARNING PRINCIPLES OF ACCOUNTING IN MALAYSIAN SECONDARY SCHOOLS

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January 2017

Chairman : Professor Wong Su Luan, PhD
Faculty : Faculty of Educational Studies

It was found that students of Principles of Accounting have yet to adopt a deep approach to learning. There is a lack of ICT usage in the accounting class; accounting students do not connect what they learn in class with the actual working place; neither is ICT used as a means to improve social interaction and other skills. The main purpose of this research was, thus, to investigate the factors that influence students' deep and surface approaches to learning for the subject of Principles of Accounting in learning environments which are supported by ICT. The proposed predictors were ICT-supported learning environment perceptions, academic ability, and prior educational experience.

This study adopted a correlational research design by using a set of questionnaire with scales measuring the predictors and approaches to learning. The sample consisted of 371 Form Four students who were studying Principles of Accounting in an ICT-supported learning environment.

The confirmatory factor analysis found that the construct of deep approach to learning was formed according to Students' Approaches to Learning (SAL) theory, which consists of sub constructs of deep motive and deep strategy. However, the surface approach was unidentifiable in the current learning context while a new learning approach named as future-oriented approach emerged in this study. This new approach could be the influence from the sociocultural and educational contextual factors in Malaysia. Descriptive statistics found that deep approach to learning was practised by students at a moderate extent (Mean = 3.22; Standard Deviation = .64); however, future-

oriented approach was adopted at high extent (Mean = 3.92; Standard Deviation = .74).

Furthermore, based on the structural equation model generated in this study – the Malaysian Students' Approaches to Learning Accounting in ICT-supported Environment (MySAL-AcICT), several significant paths were found. These significant paths are: 1) ICT-supported learning environment perceptions influenced deep approach to learning ($\beta = .848, p < .001$); 2) ICT-supported learning environment perceptions influenced future-oriented approach to learning ($\beta = .734, p < .001$); 3) academic ability influenced ICT-supported learning environment perceptions ($\beta = .149, p < .01$); and 4) prior educational experience influenced ICT-supported learning environment perceptions ($\beta = .151, p < .01$).

In addition, it was found that the construct of ICT-supported learning environment perceptions was a total mediator between academic ability and approaches to learning, and between prior educational experience and approaches to learning. Consequently, the variance of deep approach was substantially (73.4%) explained by the model; while the model also explained more than half (54.5%) of the variance of future-oriented approach.

This study proposes that students' learning approaches are influenced by both their immediate and social environments. Educators and policy makers, thus, need to consider the total environments of students for the sake of cultivating the culture of deep learning.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**PENGARUH PERSEPSI TERHADAP PERSEKITARAN PEMBELAJARAN
YANG DISOKONG OLEH ICT, KEMAMPUAN AKADEMIK, DAN
PENGALAMAN PENDIDIKAN LEPAS TERHADAP PENDEKATAN
PEMBELAJARAN PRINSIP PERAKAUNAN SEKOLAH-SEKOLAH
MENENGAH DI MALAYSIA**

Oleh

TAN BOON SEE

Januari 2017

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Pelajar Prinsip Perakaunan didapati belum mengamalkan pendekatan pembelajaran mendalam. Kelas perakaunan didapati kekurangan penggunaan ICT dan pelajar tidak dapat mengaitkan apa yang dipelajari di kelas dengan suasana tempat kerja yang sebenar. ICT juga tidak digunakan untuk meningkatkan interaksi sosial dan kemahiran lain. Maka, matlamat utama kajian ini ialah mengenal pasti faktor yang mempengaruhi pendekatan pembelajaran mendalam dan pendekatan pembelajaran permukaan yang diamalkan oleh pelajar dalam pembelajaran subjek Prinsip Perakaunan dalam persekitaran pembelajaran yang disokong oleh ICT. Faktor peramal yang dicadangkan adalah persepsi persekitaran pembelajaran yang disokong oleh ICT, kebolehan akademik, dan pengalaman pendidikan lepas.

Kajian ini adalah berdasarkan reka bentuk penyelidikan kolerasi yang menggunakan satu set soal selidik dengan skala-skala mengukur faktor-faktor peramal dan pendekatan pembelajaran. Sampel kajian ini terdiri daripada 371 pelajar Tingkatan Empat yang mempelajari Prinsip Perakaunan dalam persekitaran pembelajaran yang disokong oleh ICT.

Analisis faktor pengesahan mendapati konstruk pendekatan pembelajaran mendalam dibentuk mengikut Teori Pendekatan Pembelajaran Pelajar yang mengandungi sub-sub konstruk motif mendalam dan strategi mendalam. Walau bagaimanapun, konstruk pendekatan pembelajaran permukaan tidak dapat dibentuk dalam konteks pembelajaran kajian ini dan satu pendekatan

pembelajaran baru yang dinamakan pendekatan pembelajaran berorientasikan masa depan muncul dalam kajian ini. Pendekatan baharu ini mungkin disebabkan oleh faktor kontekstual sosial-budaya dan pendidikan di Malaysia. Keputusan statistik deskriptif mendapati pendekatan pembelajaran mendalam diamalkan oleh pelajar secara sederhana (Min = 3.22; Sisihan Piawai = .64); manakala pendekatan pembelajaran berorientasikan masa depan diamalkan pada tahap yang tinggi (Min = 3.92, Sisihan Piawai = .74).

Berdasarkan pemodelan persamaan struktur yang dibina dalam kajian ini, iaitu Pendekatan Pembelajaran Perakaunan Pelajar Malaysia di Persekitaran Pembelajaran yang disokong oleh ICT (MySAL-AcICT), beberapa penemuan yang signifikan telah didapati. Penemuan-penemuan ini ialah: 1) Persepsi terhadap persekitaran pembelajaran yang disokong oleh ICT mempengaruhi pendekatan pembelajaran mendalam ($\beta = .848, p < .001$); 2) persepsi terhadap persekitaran pembelajaran yang disokong oleh ICT mempengaruhi pendekatan pembelajaran berorientasikan masa depan ($\beta = .734, p < .001$); 3) kebolehan akademik mempengaruhi persepsi terhadap persekitaran pembelajaran yang disokong oleh ICT ($\beta = .149, p < .01$); dan 4) pengalaman pendidikan lepas mempengaruhi persepsi terhadap persekitaran pembelajaran yang disokong oleh ICT ($\beta = .151, p < .01$).

Tambahan pula, persepsi terhadap persekitaran pembelajaran yang disokong oleh ICT didapati merupakan pengantara lengkap (*total mediator*) antara kebolehan akademik dan pendekatan-pendekatan pembelajaran serta antara pengalaman pendidikan lepas dan pendekatan-pendekatan pembelajaran. Maka, sebahagian besar (73.4%) daripada varians pendekatan pembelajaran mendalam dan lebih daripada separuh (54.5%) varians pendekatan pembelajaran berorientasikan masa depan telah dijelaskan oleh model ini.

Kajian ini mencadangkan pendekatan pembelajaran pelajar adalah dipengaruhi oleh persekitaran langsung dan sosial. Justeru itu, para pendidik dan pembuat dasar perlu mempertimbangkan persekitaran keseluruhan pelajar untuk membudayakan amalan pembelajaran mendalam.

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I certify that a Thesis Examination Committee has met on (24 January 2017) to conduct the final examination of Tan Boon See on her thesis entitled “Influence of ICT-Supported Learning Environment Perceptions, Academic Ability, and Prior Educational Experience on Students’ Approaches to Learning principles of Accounting in Malaysian Secondary Schools” in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the degree of Doctor of Philosophy.

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LIST OF ABBREVIATIONS

3Ps Model	Presage-Process-Product Model
AA	Academic Ability
AIC	Akaike Information Criterion
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CO	Cooperation
CW	Commitment to Work
DA	Deep Approach
df	degree of freedom
DM	Deep Motive
DS	Deep Strategy
e	error
EDA	Exploratory Data Analysis
EFA	Exploratory Factor Analysis
EP	Emerging Path
FA	Future-oriented Approach
Fr	Fear of Failure
GFI	Goodness-of-Fit Index
HTMT	Heterotrait-monotrait ratio of correlations
ICT	Information and Communication Technology
II	Intrinsic Interest
ISLEP	ICT-Supported Learning Environment Perceptions

IVG	Investigation
IVL	Involvement
Mm	Memorisation
MOE	Ministry of Education
<i>P</i>	Level of significance
PEE	Prior Educational Experience
PM	Possible Mediator
PMR	<i>Penilaian Menengah Rendah</i> (Lower Secondary Assessment)
Qlf	Aim for Qualification
RI	Relating Ideas
R-LPQ-2F	Revised Two-Factor Version of the Learning Process Questionnaire
RMSEA	Root Mean Square Error of Approximation
RQ	Research Question
S.D.	Standard Deviation
SA	Surface Approach
SAL	Students' Approaches to Learning
SC	Student Cohesiveness
Scp	Minimising Scope of Study
SM	Surface Motive
SPM	<i>Sijil Pelajaran Malaysia</i> (Malaysian Certificate of Education)
SPSS	Statistical Package for Social Science
SS	Surface Strategy
TLI	Tucker-Lewis Index
TO	Task Orientation

TROFLEI	Technology-Rich Outcomes-Focused Learning Environment Instrument
TS	Teacher Support
Ud	Understanding
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
VIF	Variance Inflation Factor



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CHAPTER 1

Introduction

1.1 Background

Malaysia is aiming to accomplish Vision 2020, which is the nation's 30-year goal to attain the status of a fully developed country by her own mould and to achieve balanced and comprehensive development in various aspects of Malaysian life (Mahathir, 1996). To accelerate the nation's progress towards achieving the Vision, the Malaysian government has introduced a national transformation framework which encompasses the New Economic Model, Government Transformation Programme, and Economic Transformation Programme (Organisation for Economic Co-operation & Development, 2013a). It marks another historical milestone that accentuates the critical role of a highly skilled, creative and innovative workforce that will contribute to the sustainability of high-income jobs.

The New Economic Model is operationalised under the 10th and 11th Malaysia Plans (Prime Minister's Department, 2010 and 2015) to further strengthen the prospects of realising Vision 2020. As reported by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO), the New Economic Model consists of the Government Transformation Plan and Economic Transformation Plan, both of which are aimed at catalysing transformation for a brighter future (UNESCO, 2015a). The Government Transformation Plan targets three phases of implementation: the first phase (2010-2012), the second phase (2013-2015), and the third phase (2016-2020). The Plan highlights seven National Key Results Areas, *viz.* reducing crime, fighting corruption, improving academic outcomes, raising living standard of low-income households, improving rural development, improving urban public transport, and addressing the cost of living. On the other hand, the Economic Transformation Programme is aimed at improving 12 National Key Economic areas, *viz.* agriculture, business services, education, electrical and electronics, financial services, healthcare, oil, gas, and energy, palm oil, communications and infrastructure, tourism, and wholesale and retail businesses. The Programme is aimed at increasing income-generating activities and job creation through competitiveness and the attraction of foreign investment. Both Transformation Programmes identified education as the key area for national development, thus showing the government's awareness of the critical role of education in the development of social and economic capital.

Realising the importance of education to transform the country into a knowledge and innovation-based high-income economy, the Malaysian Education Blueprint (2013-2025) was launched to address various pressing issues in this sector (Ministry of Education Malaysia, 2012). This is the latest

endeavour by the government to transform the education system into one that produces competent and innovative human capital to meet the demands of the new economy and to keep pace in an increasingly competitive global economy. At the time of writing, the standard of education in Malaysia lags behind many other countries. In the Education Blueprint, it was reported only 50% of lessons were delivered effectively, while the other 50% were focused on achieving superficial understanding of content instead of nurturing higher-order thinking skills, viz. the ability to apply knowledge, skills and values while reasoning and reflecting to solve problems, make decisions, innovate, and create (Ministry of Education Malaysia, 2012).

The need to improve the quality of Malaysian education is indisputable as the evaluation of student performance under the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) showed dismal results for Malaysian students. The 2009 and 2012 PISA reports revealed that 15-year old students of Malaysia were ranked below average in the world for proficiency in reading, mathematics, and science (Walker, 2011; Organisation for Economic Co-operation and Development, 2013b)¹. The lack-lustre performance of Malaysian students puts Malaysia far behind her regional peers like Singapore, Hong Kong, Korea, and Taiwan, who were in the top 10 in PISA achievements. Similarly, the TIMSS reports showed that Malaysian students' performance in mathematics and science had slipped to below the international intermediate benchmark for three consecutive years of assessment for 2007, 2011, and 2015 (Mullis, Martin, Foy, & Hooper, 2016; Martin, Mullis, Foy, & Stanco, 2012; Mullis, Martin, Foy, & Arora, 2012).

Among the latest efforts by the Ministry of Education (MOE) to improve teaching and learning is the equipping of schools with Information and Communication

Technology (ICT). MOE acknowledges the tremendous potential of ICT to transform the educational process to support the development of higher-order thinking skills. Hence, besides investing about RM6 billion from 1999 to 2010 on ICT in education initiatives, MOE also pioneered a strategic ICT plan for the education system that included the Smart School Roadmap and the Policy on ICT in Education 2010 (Ministry of Education Malaysia, 2012).

¹Malaysia results were unable to be reported in 2015 PISA Report due to the sample did not meet the PISA response-rate standards (Organisation for Economic Co-operation & Development, 2016).

According to the education policy review reported by United Nations Educational, Scientific, and Cultural Organisation (UNESCO), Malaysia faced many challenges in integrating ICT in education to realise the goal of building a knowledge and innovation driven economy (UNESCO, 2012). For example, it was found that 80% of teachers in Malaysia spent less than one hour a week using ICT in their classes, and only a third of students stated that their teachers used ICT regularly. In addition, ICT usage did not go much further than the use of word-processing applications as an instructional tool. The infrequent integration of ICT in lessons could be attributed to the exam-oriented Malaysian education system. In fact, according to MOE, the greatest challenge in the last decade was to decrease the emphasis on examinations while shifting the focus to identifying students' weaknesses and problems in learning (Ministry of Education, 2006). Unless there is less emphasis on academic achievement, teachers would rather employ teacher-centred teaching methods than innovative teaching as it is the fastest method to prepare students for examinations (UNESCO, 2015a). Meanwhile, students have been found to learn in a passive, reception mode, merely memorising information for the sake of passing examinations (Fung, 2010; Sandora Mohd. Panut, 2004).

Furthermore, the challenge of producing quality school-leavers and graduates is quite demanding as Malaysia suffers from a shortage of skilled workers, and the talent base of workforce lacks creativity and innovation (National Economic Advisory Council, 2010). There is a mismatch between skills taught in educational institutions and skills required in the market place, with regard to both technical and soft-skills. For example, in the field of accounting, it was reported by a local study that there was a significant gap between employers' and accounting graduates' perceived skills of an accountant, e.g. employers demand graduates to be more independent and able to apply theory into the design and operation of the accounting system (Ngoo, Tiong, & Pok, 2015).

In view of the country's human capital weaknesses, the Malaysia Education Blueprint (2013-2025) aims to transform the education system by placing greater emphasis on equipping students with higher-order thinking skills as well as technical and soft skills. With the adoption of ICT and the fostering of a deep approach to learning, it is hoped that Malaysian school-leavers and graduates would be able to think more critically, and be more innovative and creative. With improvements in education, the Malaysian workforce would be able to contribute more effectively to the nation's development and the achievement of Vision 2020.

1.2 Fostering a Deep Approach to Learning for Higher-Order Thinking Skills

The role played by education today cannot be merely a medium for the transmission of knowledge, but rather it must promote the acquisition of skills for “learning to learn” (i.e. how to find, interpret, and evaluate information) that contribute to lifelong learning (Tinio, 2003). In other words, students should possess the qualities of higher-order thinking to acquire knowledge rather than merely imbibing knowledge passively. These qualities include independence, critical and creative thinking, problem-solving skills, and the ability to prioritise understanding over and above mechanical reproduction (UNESCO, 2015b; Organisation for Economic Co-operation and Development, 2004). To achieve these qualities, students need to be guided to adopting a deep approach to learning.

According to the Students’ Approaches to Learning (SAL) theory, a deep approach to learning is synonymous with effective and desirable attitudes to learning through seeking meaning of the contents, trying to relate parts to one another, associating new information with existing prior knowledge or to personal contexts. It is contrasted with a surface approach which is characterised by the motivation to acquire only sufficient knowledge to complete a task or pass a subject through rote learning (Biggs & Moore, 1993; Biggs, 1985; 1987a; Entwistle & Ramsden, 1983; Marton & Säljö, 1976). A deep approach to learning enables one to achieve various learning outcomes of higher-order thinking. For instance, a learner who always adopts a deep approach to learning would be independently taking ownership of the concepts and skills being learnt (Abbot, Townsend, Johnstone-Wilder, & Reynolds, 2009). He is critical of the lesson content (Barton & Ryan, 2014; Schmeck, 1983). By taking nothing taught as automatically correct, through questioning himself and the subject, the student is creatively linking distant elements to one another and creating unique ideas for problem-solving (Laevers, 2000). Furthermore, analytical and conceptual thinking skills are developed through a deep learning approach by organising and structuring disparate types of information into a coherent whole (Warburton, 2003). In short, a deep approach to learning is highly desirable as it produces a flexible and independent learner who will succeed in a fast-changing society.

Taking cognisance of the importance of adopting a deep approach to learning, MOE launched the Malaysia Education Blueprint (2013-2025), a comprehensive plan aimed at developing quality students who would possess thinking skills together with knowledge, leadership skills, bilingual proficiency, ethics and spirituality, and national identity (Ministry of Education, 2012). Thinking skills, according to the Education Blueprint, are honed through practising a deep approach to learning, i.e. by “instilling a love for inquiry”, students would “be able to connect different pieces of knowledge”, and “create new knowledge” (Ministry of Education, 2012, p. E10).

In addition, the Education Blueprint emphasises harnessing the potential of ICT to enhance the depth of learning and improve the overall quality of education. It is not enough to simply teach students how to employ basic ICT functions; more importantly, teachers should integrate ICT in their lessons to foster a deep approach to learning and develop higher-order thinking skills (Ministry of Education, 2012).

The present research was aimed at studying factors that affect students' adoption of a deep approach to learning in the context of accounting education in Malaysian secondary schools. Accounting was selected for the present study as Malaysia would need an estimated 60,000 professional accountants by 2020 (double the number of accountants in 2014) to serve the needs of a developed economy (The Committee to Strengthen the Accountancy Profession, 2014). In addition, accounting is always regarded as a technically-oriented subject, and accounting teachers are guided by the objectives of training students to know facts and solving problems from the technical perspective which is narrow and inadequate (Dull, Schleifer, & McMillan, 2015; Duman, Apak, Yucenursen, & Peker, 2014; Lucas, 2000; Booth, Luckett, & Mladenovic, 1999; Sharma, 1997; Eley, 1992). Therefore, it is important to examine the factors which influence students' adoption of a deep approach to learning, and particularly whether the use of ICT would be able to stimulate students to adopt such deep learning behaviour in an exam-oriented learning context.

1.3 Accounting Education and Deep Approach to Learning

In the Malaysian education system, formal elementary accounting education is taught at the upper secondary school level (i.e. Forms 4 and 5) where the fundamentals of accounting knowledge and skills are delivered through the subject known as Principles of Accounting (*Prinsip Perakaunan*). Students are taught basic concepts, principles, and accounting methods as well as skills in classifying, recording, interpreting, and summarising financial data based on business transactions (Curriculum Development Centre, 2009). The main content of this subject is the method of "accounting cycle", which encompasses the knowledge of identifying and measuring financial information through the application of the double-entry book-keeping system.

The deep approach to learning is especially important in the learning of accounting, particularly book-keeping, as most of the concepts must be mastered through understanding and not memorising ("The Purpose of Accounting Education", 2016; Sukumaran, 1991; Borthick & Clark, 1986). Furthermore, the use of ICT in the teaching and learning processes is considered helpful towards the adoption of a deep approach to learning; ICT is believed to have the potential to strengthen the learner's ability to connect what is studied in class with events in the computerised workplace and real life, thus improving social interactions, and realising personalisation in learning

besides improving the efficiency of teaching and learning (Arquero & Romero-Frias, 2013; Hiralaal, 2012).

However, with the exam-oriented learning culture long entrenched in the Malaysian classroom, the teaching of accounting, like most other subjects, tends to be teacher-centred where methods such as lecture, drill and practice, and demonstration of problem-solving by teachers are preferred by both students and teachers alike (Fatima Abdul Hamid & Nik Nazli Nik Ahmad, 2013; Rohaila Yusof, 2006; Hanuni Yusuf, 2003; Suhaida Abdul Kadir, 2002; Azura Onn, 1999; Halimah Harun, 1992). Nevertheless, the teacher-centred learning approach has been criticised for failing to foster skills in critical thinking, problem solving, and communication (Beusaert, Segers, & Wiltink, 2013; Gabbin, 2002, Foster 1995).

In short, accounting education has to move away from merely learning facts and procedures to applying a deep approach to learning, i.e. striving for meaning and understanding, and ultimately, honing students' higher-order thinking skills to enhance the quality of school leavers and graduates who would join the workforce to develop the nation. Hence, an investigation of the factors that influence the deep approach to learning accounting needs to be conducted. According to the Presage-Process-Product (3Ps) Models which conceptualise the Students' Approaches to Learning (SAL) Theory proposed by Biggs (1985) and expanded by Ramsden (2003), approaches to learning are influenced by the Presage factors of students' perceptions of the learning environment and personal characteristics. Hence, this study adopted the 3Ps model to identify and determine the impact of Presage factors on Malaysian students' approaches to learning Principles of Accounting.

1.4 Problem Statement

There have been many reports which show that the younger generation of Malaysia lacks higher-order thinking skills compared to their regional peers (e.g. Organisation for Economic Co-operation and Development, 2013b; Martin et al., 2012; Mullis et al., 2012; Walker, 2011). This may be a reflection of the education system which has been oriented towards summative assessment rather than fostering higher-order thinking skills (UNESCO, 2015a; Ministry of Education, 2006). Generally, students tend to adopt surface approaches to learning for the sole purpose of passing their examinations (Fung, 2010; Sandora Mohd. Panut, 2004).

Likewise, within the macro environment of the current education system, students of accounting have yet to adopt a deep approach to learning as it has been found that most accounting classes tend to be teacher-centred (Fatima Abdul Hamid & Nik Nazli Nik Ahmad, 2013; Rohaila Yusof, 2006; Hanuni Yusuf, 2003; Suhaida Abdul Kadir, 2002). There is also a lack of ICT usage

in the accounting class; accounting students do not connect what they learn in class with the actual working place; neither is ICT used as a means to improve social interaction and other skills. According to a study by Ngoo et al. (2015), there is a mismatch of skills taught in schools and those required by the industry, especially with regard to soft skills and technical skills.

The 3P Model complements the SAL theory on factors influencing learning approaches. Past studies have found that approaches to learning are related to both students' personal characteristics (Mohammad Alauddin & Ashman, 2014; Abhayawansa, Tempone, & Pillay, 2012; McGowen & Tall, 2010; Watty, Jackson, & Yu, 2010) and situational factors (Arquero & Romero-Frias, 2013; Hiralaal, 2012; Jebeile & Abeysekera; 2010). However, there is scant research on the theory and model in the context of the impact of ICT on accounting students, particularly in secondary Malaysian schools. Thus, research needs to be conducted to identify factors that are conducive to the adoption of the deep approach to learning Principles of Accounting.

1.5 Objectives of the Study

This study was carried out to investigate the factors impacting the deep learning approach by students of Principles of Accounting in Malaysian secondary schools, especially in an ICT-supported learning context. The predictor variables adopted in this study were based on those used in previous studies. They included students' perceptions of ICT-supported learning environment, academic ability, and prior educational experience. The present research was conducted to achieve the following specific objectives:

1. To explore students' approaches to learning;
2. To predict factors that influence approaches to learning among students studying Principles of Accounting in Malaysian secondary schools; and
3. To explain the mediator role of construct of ICT-supported learning environment perceptions for approaches to learning among students studying Principles of Accounting in secondary schools.

1.6 Research Questions and Hypotheses of the Study

Two research questions (RQ) were constructed for Objective 1 of this study:

- RQ₁: To what extent was deep approach to learning practised by students of Principles of Accounting in the learning environment supported by ICT?

RQ₂: To what extent was surface approach to learning practised by students of Principles of Accounting in the learning environment supported by ICT?

Next, the following hypotheses were formulated based on Objectives 2 and 3 of the study and the literature review:

Objective 2

- H₁: ICT-supported learning environment perceptions have a significant influence on deep approach to learning.
- H₂: ICT-supported learning environment perceptions have a significant influence on surface approach to learning.
- H₃: Academic ability has a significant influence on deep approach to learning.
- H₄: Academic ability has a significant influence on surface approach to learning.
- H₅: Prior educational experience has a significant influence on deep approach to learning.
- H₆: Prior educational experience has a significant influence on surface approach to learning.
- H₇: Academic ability has a significant influence on ICT-supported learning environment perceptions.
- H₈: Prior educational experience has a significant influence on ICT-supported learning environment perceptions.

Objective 3

- H₉: ICT-supported learning environment perceptions mediate the influence of academic ability on deep approach to learning.
- H₁₀: ICT-supported learning environment perceptions mediate the influence of academic ability on surface approach to learning.
- H₁₁: ICT-supported learning environment perceptions mediate the influence of prior educational experience on deep approach to learning.

1.7 Significance of the Study

There are five major reasons why it is beneficial to conduct this research. First, this study investigated the approaches to learning used by Malaysian students to learn Principles of Accounting. It contributes to the body of knowledge on approaches to learning as it is influenced by cultural context so that the learning phenomena found in Western culture will not be generalised to the Eastern contexts. Hence, educational programmes or services that are

responsive to the diverse sociocultural backgrounds of students can be developed.

Second, the MOE puts great emphasis on making ICT an enabler for teaching and learning to foster higher-order thinking skills of individuals who will comprise the skilled human capital of the country. This study, thus, contributes to the corpus of knowledge in the fields of ICT in education and students' approaches to learning, which can then enrich the existing knowledge of using ICT for deep approach to learning among accounting teachers in Malaysian secondary schools.

Third, this research could make a prima facie contribution to determine the factors that influence approaches to learning by investigating students' perceptions of their learning environments and individual characteristics. For example, by understanding that students' favourable perceptions of ICT-supported learning environments were associated to deep approach to learning, teaching strategies have to integrate ICT more often to encourage the deep learning approach. Thus, the study provides valuable information to educators and policy-makers to identify the possible factors that impact the learning of Principles of Accounting. It gives vital information to accounting teachers to enhance their pedagogical approach towards encouraging the deep learning approach, while helps policy-makers to decide on a revised policy or direction for the accounting curriculum and assessment. The Ministry of Education could also enhance the teaching and learning of accounting through providing professional development programmes for accounting teachers to enhance their knowledge, skills, and attitudes in teaching.

Fifth, by identifying the antecedents for approaches to learning, this study would benefit the Education Ministry by helping it improve the Malaysian education system as a whole, especially in harnessing ICT to cultivate a deep approach to learning and to hone higher-order thinking skills.

Overall, this study contributes to the corpus of knowledge regarding ICT and SAL, particularly in the context of accounting education. It provides important information for educators and administrators to improve both the learning environment and learning outcomes by encouraging students to adopt the more desirable, deep learning approach.

1.8 Scope and Limitations of the Study

The scope of this study is confined to the learning of Principles of Accounting with the support of ICT in secondary Malaysian schools. In addition, the use of ICT covers particularly the influence of generic software (e.g. word processing, spreadsheet) and Internet-enabled technologies used for facilitating learning and communication (e.g. blog, email) as they are the

common technologies for ICT-supported learning environments. Thus, the generalisation of this study can only be applied to studies that have a similar scope.

Furthermore, as the main objective of the present study was to investigate factors that influenced students' approaches to learning, the focus was on the elements of Presage and Process of the 3Ps model for students' approaches to learning (Ramsden, 2003; Biggs, 1985). The 3Ps model was adopted in the present study as it is concerned with the influence of students' Presage factors on their Processes of learning or more specifically, their approaches to learning. Though the model consists of the Product element which represents the learning outcome and delineates its relationships with Presage factors and the Process of learning, the Product element is not within the scope of the present study as the study focused on the ways of learning. In other words, this study emphasised the Process rather than the Product of learning, as according to Pace, "what account [matters] most is not who you are or where you are but what you do" (1998, p.28). The findings of this study, thus, would shed light on the Process of learning by examining the Presage factors that influenced students' approaches to learning. These findings would provide useful information that is much more needed for current educational research compared to Product indicators.

Moreover, many studies maintain that the deep learning approach is related to high quality learning outcomes, while the surface approach is associated with lower quality outcomes (Cetin, 2016; Bliuc, Ellis, Goodyear, & Hendres, 2011; Chan, 2010; Cassidy, 2006; Struyven, Dochy, Janssens, & Gielen, 2006; Byrne, Flood, & Willis, 2004; Duff, Boyle, Dunleavy, & Ferguson, 2004; Lizzio & Wilson, 2004; Biggs, 2003; 1999; 1987a; 1985; Snelgrove & Slater, 2003; Lizzio et al., 2002; Biggs, Kember, & Leung, 2001; Entwistle, McCune, & Walker, 2001; Zeegers, 2001; Crawford, Gordon, Nicholas, & Prosser, 1998; Trigwell & Prosser, 1991; Prosser & Millar, 1989; Marton & Säljö, 1984). The deep approach to learning with an intention to comprehend and activate conceptual analysis results in a deep level of understanding of content, while the surface approach with routine, unreflective memorisation, and procedural problem-solving inevitably leads to restricted conceptual understanding. As learning outcomes are mainly determined by the learning process, the present study, therefore, focuses mainly on the factors influencing the Process of learning rather than the Product of learning.

As this study is cross-sectional in nature, it provides a snapshot of factors influencing students' approaches to learning. Thus, there is a limitation to understanding the possibility of students' behavioural change in the long run.

Furthermore, the students' characteristics investigated in this study are limited to only academic ability and prior educational experience as these are the two important Presage personal factors that influence the learning of Principles of

Accounting. Thus, future studies on students' approaches to learning would need to investigate the influence of other personal characteristics of students such as their personalities and prior computer experiences.

This research involved a sample size of 371 secondary school respondents who were randomly selected from five states, namely Kedah, Selangor, Johore, Kelantan, and Sabah. Thus, the sample size limits the generalisability of this study to other states and students from other levels, e.g. primary or tertiary level.

Finally, as the questionnaire was self-reported, the results of the study might be affected by the accuracy and honesty of the respondents when answering the questionnaire and providing information during interviews. In other words, the findings were subjected to individual bias and responding errors.

1.9 Definition of Terms

For the purpose of this study, the variables in this research are constitutively and operationally defined as follows:

1.9.1 Students' Approaches to Learning

Students' Approaches to Learning (SAL) is defined as the ways students perceive a particular academic task and how they handle it (Marton & Säljö, 1976). In addition, SAL is seen as a contextually dependent response rather than an enduring characteristic of the individual (Meyer, Parsons, & Dunne, 1990). In this study, SAL is defined as a student's motive and strategy to learn (Biggs, 1985). Motive reflects why he or she is studying, while strategy denotes how he or she goes about studying. SAL is further divided into two contrasting approaches, *viz.* deep approach and surface approach, which are defined as follows:

Deep Approach

A deep approach entails the learner attempting to understand the meaning of learning materials before relating one part to another, or linking new ideas to previous knowledge or to personal meaningful contexts (Kember, Biggs, & Leung, 2004; Biggs, Kember, & Leung, 2001; Wong, Lin, & Watkins, 1996; Biggs & Moore, 1993; Biggs, 1987a; 1985; Marton & Säljö, 1976). It concerns the individual's intrinsic motivation and interest in the content of the task. In this study, a deep approach is said to have been adopted by the student when he or she has a genuine motive for wanting to understand the content being taught; the student has an intrinsic interest and is committed to applying deep strategies (i.e. relating ideas and understanding) to tackle a learning task.

Surface Approach

A surface approach is characterised by extrinsic or instrumental motivation to acquire only sufficient knowledge to complete a task or pass an examination subject (Kember, Biggs, & Leung, 2004; Biggs, Kember, & Leung, 2001; Wong, Lin, & Watkins, 1996; Biggs & Moore, 1993; Biggs, 1987a; 1985; Marton & Säljö, 1976). Students who adopt a surface learning approach tend to memorise facts without any attempt to make meaningful connections; they reproduce facts through rote learning and/or view a particular task in isolation from other tasks and real life as a whole. In this study, a surface learning approach refers to the student's surface level or extrinsic motivation for his or her studies such as fear of failure and aiming for qualification, and the application of surface strategies (i.e. minimising scope of study and memorisation) to tackle a learning task.

1.9.2 ICT-Supported Learning Environment Perceptions

ICT-supported learning environment perceptions are defined as the ways students understand or interpret their learning environments in which ICT is used to either sustain or assist their learning (Mercer & Fisher, 1992; Mevarech & Light, 1992; DeCorte, 1990). These perceptions incorporate three dimensions of environments identified as Relationship, Personal Growth, and System Maintenance and System Change (Moos, 1974). In the present study, ICT-supported learning environment perceptions are defined as how students understand or interpret their learning environments for Principles of Accounting when learning is assisted by various ICT tools, including generic software (e.g. word processing, spreadsheet), on-line information and communication tools (e.g. email, blog, forum, portal), and search engines (e.g. Google). It is operationalised into seven scales based on the dimensions of Relationship (i.e. student cohesiveness, teacher support, and involvement), Personal Growth (i.e. cooperation and investigation), and System Maintenance and System Change (i.e. task orientation and ICT usage). The conceptual and operational definitions of these seven scales are defined as follows:

Student Cohesiveness

Student friendships and the extent to which students help each other and enjoy working together (Moos, 1979). In this study, this scale is defined as the extent to which students know, help, and support one another.

Teacher Support

Help, interest, trust, and friendship the teacher shows towards students (Moos, 1979). In this study, teacher support is defined as the extent to which the teacher helps, befriends, shows his or her concerns and interest in students.

Involvement

The extent to which students are attentive and interested in class activities and participate in discussions (Moos, 1979). In the present study, involvement is defined as the degree students have attentive interest, participate in discussions, and are included in various class activities.

Cooperation

The potential or opportunity the environment for students working together towards the same goal (Newhouse, 2001). In the current study, it is the extent to which students cooperate, share resources, learn from one another during learning tasks, and work as a team to achieve class goals.

Investigation

The extent to which the student is encouraged to engage in inquiry learning for problem solving (Fraser, 1990). In this study, this scale is defined as the degree to which skills of inquiry are used in problem solving.

Task Orientation

The degree of emphasis on completing planned activities and sticking to the subject matter (Moos, 1979). In the present study, it is defined as the extent to which there is clarity of class goals and determination to complete planned activities and to stay on the subject matter.

ICT Usage

The extent to which students use ICT to assist their learning (Maor & Fraser, 1993). In this study, it is defined as the degree to which the student uses ICT as a tool to complete assignments, communicate with others, and to search for and access information.

1.9.3 Academic Ability

Academic ability refers to a person's capacity to learn; this is measured by his or her prior performance in examinations (Duff, 2004; Lizzio et al., 2002; Auyeung & Sands 1994). In the current study, academic ability is defined as the previous level of achievement of Form 4 students in their summative examination, namely the Lower Secondary Assessment (*Penilaian Menengah Rendah, PMR*), for Mathematics, Science, and Malay Language (*Bahasa Melayu*).

1.9.4 Prior Educational Experience

Prior educational experience is defined as a person's previous experiences in educational settings (Biggs, 2003; Ramsden, 2003). In the present study, prior educational experience is defined as the student's prior formal accounting knowledge that he or she has obtained and previous business or entrepreneurial experience. With regard to prior accounting knowledge, the formal accounting knowledge a student can obtain before Principles of Accounting is from the Commerce and Entrepreneurship option of the Integrated Living Skills (*Kemahiran Hidup Bersepadu*), a subject taught at lower secondary school. Previous business or entrepreneurial experience of a student can be obtained from family, school, work, or self-organised business or entrepreneurial activities. These experiences provide the foundation for understanding various accounting concepts such as documents, sales and purchase, expenses and revenue, and profit and loss.

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BIODATA OF STUDENT

Tan Boon See was born on the 29th May 1974 in Kuala Lumpur, Malaysia. She attended primary school at S.R.J.K. (C) Batu 9 Cheras, Selangor and secondary school at S.M.J.K. Yu Hua, Kajang, Selangor. She then received her post-secondary education at S.M. Tinggi, Kajang, Selangor.

She continued her tertiary education at Universiti Putra Malaysia (UPM) for the degree of Bachelor of Science (Resources Economics) in 1994. After graduation, she obtained her first working experience as Material Planner at Iris Technologies (M) Sdn. Bhd (currently named as IRIS Corporation Berhad). She further pursued her post graduate education at Graduate School of Management (currently named as Putra Business School), UPM for the degree of Master of Business Administration (Marketing) in 2000. She was then worked as a part-time tutor to coach undergraduates and later the postgraduates on using statistical software (SPSS and AMOS) to conduct statistical analysis at Faculty of Economics and Management and Graduate School of Management, UPM respectively. She started her career in the education field as lecturer at Binary University College (currently named as Binary University) in 2003 after obtaining her Master degree. For enhancing her knowledge in pedagogy and educational research, she embarked on her doctoral studies in 2007.

During her doctoral study period, she involved in assisting the Doctoral Student Consortia of International Conference on Computers in Education (ICCE) hosted by Asia-Pacific Society for Computers in Education (APSCE) in several countries i.e. Malaysia, Singapore, and Japan. She was the winner of Community Service Award granted by APSCE for three consecutive years from 2012 to 2014. She was also conferred by APSCE the Merit Scholarship Award for attending ICCE in Singapore and Japan in 2012 and 2014. Meanwhile, she also worked as a part-time tutor to assist in coaching pre-service teachers for their assignments of the subjects of Educational Research and Accounting Education at Faculty of Educational Studies, UPM. She was later offered the job opportunity as lecturer for Early Childhood Education programme in Alfa International College from 2012 to 2015. She married to Loke Weng Cheong in 2009 and has given birth to two baby boys in 2011 and 2018.

LIST OF PUBLICATIONS

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