Exploring Deep Approach to Learning for Accounting through ICT-Supported Learning Environment in Malaysian Secondary Schools: A Preliminary Study

Boon See TAN[a]* & Su Luan WONG[b]
[a]*Faculty of Educational Studies,Universiti Putra Malaysia, Malaysia*
[b]*Faculty of Educational Studies, Universiti Putra Malaysia, Malaysia*
*bstan_29@yahoo.com

Abstract: Under the commitment of the Malaysian Ministry of Education to transform the curriculum and assessment of Principles of Accounting in secondary schools where deep approach to learning is critical for attaining quality learning outcomes, this preliminary study aims to assess the instrument used to measure students' approaches to learning for Principles of Accounting and perceptions of ICT-supported learning environment. It also aims to explore the current status of students in terms of these two variables, and their relationship. A total of 33 secondary school students who are studying Principles of Accounting in an ICT-supported learning environment participated in this study. They responded to the questionnaire which consists of the subscales of Deep Approach, Surface Approach that measure students' approaches to learning, as well as subscales of Student Cohesiveness, Teacher Support, Cooperation, Involvement, Investigation, Task Orientation, Computer Usage, and Appropriate Assessment that assess for perceptions of ICT-supported learning environment. The findings indicate that the measures for Surface Approach need to be refined as it only obtained a satisfactory level of reliability value compared to other subscales. The descriptive statistics findings reveal that students exhibited higher deep approach than surface approach to learning. They also showed a rather low score in Appropriate Assessment which may reflect a more fact-and memory oriented assessment was perceived. Further Pearson correlation analysis suggests that Teacher Support and Computer Usage are the main variables to be significantly related to Deep Approach. They are simultaneously associated with other subscales of perceptions such as Student Cohesiveness, Cooperation, Involvement, Investigation, and Task Orientation that are also significantly related to Deep Approach. In addition, most of the subscales of perceptions are related to Deep Approach except Appropriate Assessment. This suggests that the perceived fact and memory-oriented assessment was not significantly associated with Deep Approach.

Keywords: Deep approach to learning, surface approach to learning, perceptions of ICT-supported learning environment, Principles of Accounting

1. Introduction

Accounting is widely referred to as the "language of business". Its functions are identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information (Martin, 1994). The fundamental of accounting encompasses the basic knowledge of accounting in identifying and measuring financial information through the application of the double-entry book-keeping system. In Malaysia, the education of fundamental accounting starts at the upper secondary school level (i.e. Form 4 and 5 or Grade 10 and 11) where the accounting knowledge and skills are delivered through the subject of Principles of Accounting. This subject consists of the concepts, principles, and accounting methods complemented by the

skills in recording, classifying, interpreting, and summarising financial data based on business transactions (Technical Education Department, 2000).

It was observed by few researchers that students always perceive that learning accounting is simply about learning a set of rules and evidences suggest that they tend to adopt a surface learning approach compared to other subjects (Eley, 1992; Beattie, Collins, & McInnes, 1997; Booth, Luckett, & Mladenovic, 1999; Lucas, 2001). Similarly, in the Malaysian context, students' learning for the subject of Principles of Accounting has yet to achieve deep approach as it was found that most of the accounting teachers tended to use the teacher-centred teaching methods such as lecture, drill and practice, and demonstration of problem solving without delving deeper into the knowledge (Suhaida Abdul Kadir, 2002; Hanuni Yusuf, 2003; Rohaila Yusof, 2006). Such methods could lead to surface learning where the lower-level procedural skills are acquired without processing information for meaning. This may be a reflection of the exam-oriented education system which is the common learning issue faced by Asian countries. It affects many teachers unwilling to take the risk of students' failure in examination by attempting innovative teaching. They would rather employ the teaching methods which comply with the requirements of the examination system which is mostly teacher-centred (Looi, Hung, Chen, & Wong, 2006). Moreover, students are short of the ICT skills to adopt deep approach to learning for managing the whole set of accounts by relating the processes of accounting cycle into a coherent whole (Arfah Salleh, 2001; Rashidah Hassan & Arfah Salleh, 2008; Tan & Wong, 2012).

In view of the aforementioned weaknesses in the Principles of Accounting education, the Malaysian Ministry of Education has strived to transform its curriculum and assessment from content-based to skilled-based from 2010 onwards where deep approach to learning is critical for attaining the desired learning outcomes such as the master of ICT skills and soft skills (e.g. higher order thinking skills, communication skills, problem solving, and decision making skills) (Bahagian Pembangunan Kurikulum [Curriculum Development Section], 2009). However, to what extent the revised curriculum and assessment are able to foster students' deep approaches to learning, particularly under the ICT-supported learning context? Thus, a preliminary study was conducted with the following objectives:

- To assess the appropriateness and reliability of the instrument;
- To take the first step in exploring students' approaches to learning and perceptions of ICT-supported learning environment; and
- To conduct initial investigation on the relationship between students' perceptions of ICT-supported learning environment and approaches to learning.

2. Literature Review

2.1 Students' Approaches to Learning (SAL)

SAL is defined as the ways in which how a student perceived a particular academic task and then 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). It is further identified into two contrasting approaches i.e. deep approach and surface approach. A deep approach entails learners' intrinsic motivation and interest to attempt to understand the meaning of the learning material and relate parts to each other, new ideas to previous knowledge or to personal meaningful context; whereas a surface approach is characterised by extrinsic motivation to acquire only sufficient knowledge to complete the task or pass the subject and thus, learners tend to memorise separate facts and/or view a particular task in isolation from other tasks and real life as a whole (Marton & Säljö, 1976; Biggs, 1985; 1987a; Biggs and Moore, 1993; Wong, Lin, & Watkins, 1996; Biggs, Kember, & Leung, 2001; Kember, Biggs, & Leung, 2004).

2.2 The Influence of ICT-Supported Learning Environment Perceptions on Approaches to Learning

There have been many studies reporting that significant relationships exist between students' perceptions of learning context and approaches to learning. It was found that approaches to learning are influenced by different perceptions of students studying different subject areas (Ramsden, 1979). In this vein, accounting students were especially influenced by their learning context which perceived as being tensed up with pressure and demands from the professional accounting bodies and there was evidence that most of them adopt the surface approaches to learning (Eley, 1992; Gow, Kember, & Cooper, 1994; Sharma, 1997; Booth et al., 1999; Jackling, 2005; Lord & Robertson, 2006; Abraham 2006). On the other hand, deep approach to learning was found to be associated with perceived quality teaching support (Eley, 1992; Chan & Watkins, 1994; Lizzio, Wilson, & Simons, 2002), appropriate pedagogy which encourages independence, interaction, and inquiry (Eley, 1992; Abraham, 2006), and appropriate assessment (Abraham, 2006; Watty, Jackson, & Yu, 2010).

Furthermore, the ICT-supported learning environment is especially contributing to students' perceptions of interactivity and involvement (Maor, 2000; Law, Lee, & Chow, 2002; de Lange, Suwardy, & Mavondo, 2003; Jebeile & Abeysekera, 2010; Premuroso, Tong, & Beed, 2011), inquiry and investigation (Basu & Cohen, 1994; Siragusa, 2002; Jones, Scanlon, Gaved, Blake, Collins, Clough et al., 2013), authencity of learning (Basu & Cohen, 1994; Green, Reinstein, & Mc Williams, 2000; Murphy & Hoeppner, 2002; Marriott, 2004; Stanley & Edwards, 2005; Neal 2005), cooperation (Rumpagaporn, 2007), differentiation (Jebeile & Abeysekera; 2010) as well as the perceptions of teacher support (Rumpagaporn, 2007; Lillie & Wygal, 2011). These perceptions were found contributing to students' deep approaches to learning. Meanwhile, the ICT-supported learning environment perceived by students to have replaced them by producing the accounting reports automatically (Green et al., 2000) and being a safety net for absence (Wells, de Lange, & Fieger, 2008) were associated to surface approaches to learning.

3. Methodology

This study was conducted through adopting the quantitative descriptive research design to explore students' perceptions of ICT-supported learning environment and approaches to learning as well as their relationship. It was conducted through a survey where questionnaires were developed and distributed to the targeted respondents to collect the related information.

3.1 Subject
The subjects were 33 Form 4 (or Grade 10) students who are studying Principles of Accounting under an ICT-supported learning environment which is defined by Aldridge, Dorman, and Fraser (2004) as an environment where students could utilise various ICT tools to assist their learning. For example, using ICT to complete and submit assignments, search information, obtain notes, and conduct on-line discussion and communication with teacher and peers.

3.2 Measures
Students were asked to complete a questionnaire assessing their approaches to learning and perceptions of ICT-supported learning which was adapted from the Revised Two-Factor version of the Learning Process Questionnaire (R-LPQ-2F) (Kember, Biggs, & Leung, 2004), Technology-Rich Outcomes-Focused Learning Environment Inventory (TROFLEI) (Aldridge et al., 2004), and Course Experience Questionnaire (CEQ) (Wilson, Lizzio, & Ramsden, 1997). They were requested to respond to a five-point Likert scale for all the items in the questionnaire from "strongly disagree" to "strongly agree". The questionnaire was back-to-back translated into the Malay language as most of the students in public secondary schools in Malaysia are proficient in this language.

The R-LPQ-2F was adapted to determine students' approaches to learning. It consists of 22 items where both Deep and Surface Approach are measured by 11 items respectively. This instrument is chosen as it is specially designed to measure the approaches to learning of secondary

school students and it is a shorter version that is suitable for use as a classroom evaluation tool which was developed from the original version of Learning Process Questionnaire (LPQ) designed by Biggs (1987b). Moreover, this simple two-factor instrument was verified by the authors as valid and reliable with good psychometric properties. It contains scales that scored good Cronbach alpha values (Deep Approach = .82 and Surface Approach = .71) and exhibited good construct validity (Comparative Fit Index, or CFI = .967, Standardised Root Mean Squared Residual, or SRMR = 0.036).

On the other hand, students' perceptions of ICT-supported learning environment were assessed through the instrument adapted from the Technology-Rich Outcomes-Focused Learning Environment Inventory (TROFLEI) (Aldridge et al., 2004) and Course Experience Questionnaire (CEQ) (Wilson et al., 1997). The TROFLEI provides the scales of Student Cohesiveness, Teacher Support, Cooperation, Involvement, Investigation, Task Orientation, and Computer Usage where each subscale was measured by seven to nine items; while the scale of Appropriate Assessment was developed from CEQ which is measured by five items. TROFLEI is renowned in terms of its reliability and validity for being extensively cross-validated in various countries such as Taiwan and Australia (Aldridge, Fraser, & Huang, 1999); and the United Kingdom, Canada, and Australia (Dorman, 2003). It is also advocated by the authors that the instrument showed good reliability where its scales yielded high Cronbach's alpha values (ranging from .77 to .95) with sound construct validity (CFI=0.98). In addition, the Appropriate Assessment scale from CEQ was validated by the authors as it attained consistently good Cronbach's alpha values ranging from .69 to .75. for three consecutive years of study. It also yielded high loadings for each item ranging from .56 to .85 which reflected good construct validity.

3.3 Procedures

The questionnaire was directly administered by the main author of the present study to all the subjects in order to ensure the genuineness of the data collection process and to obtain higher response rate. In addition, respondents were given prompt assistance should they encounter any difficulties in answering the questionnaire. Permission was first acquired from the school principal followed by discussion with the Principles of Accounting teachers on the suitability of date, time, and place for conducting the survey. The survey process started with a 10-minute briefing on the purpose of the research and instructions on how to answer the questionnaire.

4. Results

The first stage of this study employed the reliability test to assess the internal consistency of each subscale, followed by descriptive statistics in order to understand the overall status of respondents' perceptions. Pearson correlation was used for analysis of relationships among the subscales in the second stage by reporting the inter-correlational matrix to provide an overview of the univariate relationships.

4.1 Reliability and Descriptive Statistics

Each subscale of the instrument achieved a high level of reliability, except for Surface Approach. Thus, a few items were dropped from this subscale in order to secure a satisfactory level of reliability. The reliability values i.e. Cronbach's alpha values (α) together with descriptive statistics for each subscale are shown in Table 1.

All means are greater than 3.5, except the Surface Approach and Appropriate Assessment. It indicates that students generally have positive perceptions towards their learning environment and have low tendency to adopt surface approaches to learning but are more inclined towards using deep approach. However, the rather low mean value in Appropriate Assessment may reflect a more fact- and memory-oriented assessment for the subject of Principle of Accounting. In addition, the standard deviations for all subscales were less than 1 and this suggests that the scores tend to be very close to the mean scores.

Table 1: Reliability values and descriptive statistics of the subscales.

Subscale	Mean	Standard Deviation	Items	Cronbach Alpha (α)
Approaches to Learning				
Deep Approach (DA)	3.83	.69	11	.91
Surface Approach (SA)	3.01	.66	6	.71
Perceptions of ICT-Supported Learning Environment				
Student Cohesiveness (SC)	3.83	.73	8	.91
Teacher Support (TS)	3.79	.84	8	.92
Cooperation (CO)	4.06	.71	8	.93
Involvement (IV)	3.72	.64	8	.85
Investigation (IVT)	3.62	.76	7	.88
Task Orientation (TO)	3.88	.67	8	.89
Computer Usage (CU)	3.72	.94	9	.93
Appropriate Assessment (AA)	2.68	.89	5	.80

4.2 Inter-correlation Matrix

Table 2 shows the inter-correlation matrix for scores on the 8 subscales of Perceptions of ICT-Supported Learning Environment, Deep Approach, and Surface Approach.

Table 2: Inter-correlation matrix between Deep Approach, Surface Approach, and subscales of Perceptions of ICT-supported Learning Environment (N=33).

	DA	SA	SC	TS	CO	IV	IVT	TO	CU
SA	.43*								
SC	.43*	.03							
TS	.73**	.25	.57**						
CO	.35*	.07	.66**	.50**					
IV	.42*	-.05	.83**	.65**	.76*				
IVT	.44*	.16	.43*	.47**	.72**	.64**			
TO	.56**	.23	.54**	.58**	.59**	.65**	.68**		
CU	.51**	.03	.67**	.34	.34	.48**	.36*	.53**	
AA	.02	-.10	-.29	-.04	-.42*	-.19	-.29	-.25	-.16

Notes: * = p < .05; **= p < .01

Deep Approach has significant positive relationships with all the subscales of perceptions, except Appropriate Assessment (r=.02). Meanwhile, Appropriate Assessment does not have significant relationships with most of the other subscales of perceptions. Furthermore, Teacher Support has the strongest positive relationship (r=.73) with Deep Approach which reflects the strong link between teacher's role and students' adoption of the deep approach. In addition, Teacher Support is significantly related to other subscales of perceptions such as Cooperation (r=.50), Involvement (r=.65), Investigation (r=.47), and Task Orientation (r=.58). It further suggests the importance of teacher's role in the learning environment.

On the other hand, none of the subscales is significantly related to Surface Approach. This could suggest that the ICT-supported learning environment which forms students' perceptions towards Student Cohesiveness, Teacher Support, Cooperation, Involvement, Investigation, Task Orientation, Computer Usage, and Appropriate Assessment is not associated to Surface Approach but more towards Deep Approach.

Furthermore, it is found that Computer Usage has significant relationships with many other subscales such as Student Cohesiveness (r=.67), Involvement (r=.48), Investigation (r=.36), and Task Orientation (r=.53). This suggests that ICT is related to many dimensions of the learning environment.

Lastly, it was found that many of the subscales of perceptions are strongly related, e.g. Student Cohesiveness and Involvement (r=.83), Involvement and Cooperation (r=.76), and Cooperation and Investigation (r=.72). It could suggest a phenomenon of multicollinearity which one should pay attention when conducting multiple regression analysis. Multicollinearity is an undesired statistical phenomenon in which two or more independent variables in a multiple regression model are highly correlated and will affect the accuracy of the model (Hair, Anderson, Tatham, & Black, 1995).

5. Discussion

From the findings, it reveals that the instrument measures for Surface Approach needed to be further refined as a few items had to be dropped in order to obtain a satisfactory but relatively lower reliability value compared to other subscales.

On the other hand, though there are many studies claiming that students adopt the surface approach for accounting by rote learning a set of rules (Eley, 1992; Beattie et al., 1997; Booth et al., 1999; Lucas, 2001), the present study preliminarily found that students demonstrated deep approach for learning Principles of Accounting. This phenomenon was found strongly associated to the perceptions of teacher support and it is consistent with many studies that found the significant relationship between teacher support and deep approach (Eley, 1992; Chan & Watkins, 1994; Lizzio et al., 2002), as well as teacher support and deep approach under the learning environment that supported by ICT (Rumpagaporn, 2007; Lillie & Wygal, 2011). Furthermore, the significant positive relationships between perceptions of teacher support and cooperation, involvement, investigation, or task orientation could suggest that the right pedagogy employed by a teacher which encourages independence, interaction, and inquiry is able to foster deep approach to learning which was proposed by Eley (1992) and Abraham (2006).

Moreover, this study also shows the significant positive relationships between perceptions of computer usage and many other perceptions that are simultaneously related to deep approach significantly such as student cohesiveness, involvement, investigation, and task orientation. These results are coherent with many studies which advocate the impact of these perceptions on deep approach to learning in the ICT-supported learning environment (Basu & Cohen, 1994; Maor, 2000; Law et al., 2002; Siragusa, 2002; de Lange et al., 2003; Jebeile & Abeysekera, 2010; Premuroso et al., 2011; Jones et al., 2013). Thus, the findings could suggest that ICT plays an important role in fostering deep approach to learning.

Finally, the perceptions of assessment which were found to be unrelated to deep approach may reflect that the perceived fact- and memory-oriented assessment could hardly be related to deep learning. The result is in contrast with the studies conducted by Abraham (2006) and Watty et al. (2010) which advocated that deep approach to learning is influenced by the perceptions of assessment.

6. Conclusion and Future Research

This preliminary study found that students demonstrated deep approaches to learning Principles of Accounting in an ICT-supported learning environment. In this vein, deep approach to learning was found to be positively related to various perceptions of ICT-supported learning environment, particularly the perceptions of teacher support and computer usage. It may reflect that a good teaching environment that employs appropriate pedagogy and technology could encourage students to adopt deep approaches to learning. This supports the concept of Technological Pedagogical Content Knowledge (TPCK) (Mishra and Koehler, 2006) which advocates that good teaching require an understanding of how technology constructively relates to pedagogy and content. Thus, technology is not just an "add on" in the teaching and learning process; rather, the skill and art of using technology and the context of its use are the key determinants for stimulating deep approach to learning.

On the other hand, more effort has to be put in to improve the assessment of Principles of Accounting as the current findings show a more fact- and memory-oriented assessment as perceived by students. As advocated by researchers, deep approach to learning is especially

important in the learning of accounting because most of the concepts must be mastered through understanding and not memorising (Sukumaran, 1991; Borthick & Clark, 1986). In this vein, students must see the general principles which organize all procedures of accounting into a coherent whole rather than rote learning the procedural rules. Therefore, appropriate assessment which evaluates students' level of meaningful understanding is important for fostering deep approach to learning.

Further research has to be conducted to consolidate the research instrument, especially the items measuring Surface Approach, in order to obtain a more reliable result. On one hand, more samples have to be included for future studies to ensure the representativeness and generalisability of the sample. In addition, more variables have to be involved in predicting approaches to learning as suggested by Biggs (1985) because both the students' personal and situational factors could influence learning approaches. Since the perceptions of ICT-supported learning environment which were studied in the present research are the situational factors, more personal factors have to be examined in future such as students' academic abilities, prior educational experience, and personalities. Finally, by involving more samples and variables in this study, a more sophisticated analysis method such as Multiple Regression Analysis (MRS) or Structural Equation Modelling (SEM) (Bentler, 1980; 1983; Bollen, 1989) can be employed. The MRS is able to identify the best independent variable which can contribute to the deep or surface approach to learning, while SEM has the capability in estimating and testing hypothesised interrelationships among the observed and latent variables.

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