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I Don't Like IT: Exploring Challenges in Accounting Information Systems Education

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ABSTRACT

Demand for Accounting Information Systems (AIS) knowledge has increased exponentially over the past two decades. Yet, learning AIS has proven to be a major challenge for accounting students as it does not usually follow the 'traditional' style of accounting education and the AIS curriculum is often ill structured. This paper presents major challenges that accounting students face in their AIS studies, along with potential pedagogical solutions aimed at alleviating such challenges. A survey instrument was developed and pilot tested and data were gathered from 618 predominantly accounting students (95%) enrolled in AIS subjects. The collected data were analyzed using Structural Equation Modeling in association with Partial Least Squares technique. The results shows that unit structure, prerequisite knowledge in IS, critical thinking assessment, teaching style and available assistance to students have significant influence on students' learning experience in AIS courses.

Keywords

Accounting Information Systems, Information Systems Education, Learning Experience, Learning Challenges

INTRODUCTION

The ongoing advancements in Information Systems (IS) and in its business applications have necessitated an integration of IS concepts in accounting education (Borthick 1996). These changes in technology along with the increasingly global nature of business also contributed to the broadening of skills required of accounting graduates to be able to pursue a career in the accounting profession (Kavanagh and Drennan 2008). This has been coupled with a growing interest in AIS expertise in the workforce (Dillon and Kruck 2008). Consequently, accounting education is changing rapidly and inciting a constant evaluation of how best to present information systems theory to accounting students (Potter and Johnston 2006).

AIS is interdisciplinary in nature and is often characterized as spanning the fields of accounting and IS. However, educating accounting students in the area of information systems is a major challenge for many academics. Unlike traditional accounting education which often incorporates financial accounting, management accounting and taxation, AIS is the newest and the least standardized component of the curriculum (Barkman 1998; Borthick 1996). This is exacerbated by minimal

authoritative guidance from international accounting bodies (Chayeb and Best 2005). Various approaches have been adopted to teach AIS at different institutions. Some academics focus on system knowledge such as programming, databases and system design and development, while others focus on internal controls and business process as prerequisites to auditing subjects (Barkman 1998).

The aim of this study is to investigate and understand the challenges accounting students face in studying AIS with the objective of incorporating remedial measures to facilitate students' understanding and appreciation of the field. It considers two equivalent undergraduate AIS units offered as part of the accounting degree at a large university. Both units are equivalent, using the same textbook and covering similar topics. As such, students are only required to complete one of the two units. Over 13 weeks of semester, the main topic areas covered in these subjects are Information Systems Fundamentals, Businesses Cycles, Controls, Ethics, Systems Development Methodologies, and Documentation. It is worthwhile noting that both units encourage critical deliberation and reflection as opposed to a replication of content through rote learning. The next sections present the study background, followed by a review of relevant literature and a formulation of research hypotheses, model, analysis and discussion of the results.

HYPOTHESES DEVELOPMENT AND BACKGROUND

Improving the quality of students' learning experience and outcomes has always been a focus of research in education and psychology (Gravoso et al. 2002). Drawing from the authors' experiences in teaching AIS subjects (Young and Aoun 2008), a review of relevant literature, and a pilot test, eight factors were proposed to investigate students' learning experience in AIS subjects. The preliminary pilot study incorporated 100 questions to measure students' learning experiences in AIS courses, with the survey completed by 120 students. Using factor analysis, 51 items were selected and eight factors emerged. These factors are teaching style, assistance to students, transition to university, assessment, communication skills, appreciation of AIS, unit structure and pre-requisite IS knowledge. The factors and related hypotheses are discussed below.

Teaching styles

The majority of students enrolled in the AIS subjects are international students (mostly from South East Asia). Harman (2004, p. 101) asserts that "Australia has become the third largest exporter of higher education, mainly to a limited number of South East Asian countries". The literature acknowledges several difficulties faced by international students, especially relating to styles of education. Ladd and Ruby (1999) point out the important differences between the Chinese and the western styles of education. The Chinese system perceives the teacher as the ultimate authority and discourages disagreement. When a western system is abruptly introduced, where difference and debate are accepted and often encouraged, and where there are no clear right and wrong answers, it could create an uncertain and stressful environment for some international students of South East Asian origin. They recommend that instructors should investigate international students' learning styles and gradually introduce western teaching styles to the classroom. It is therefore worthwhile investigating the familiarity of students' with the teaching style in the AIS subjects. It is hypothesized that:

H1: Familiarity with teaching style has a positive impact on overall students' learning experience in AIS subjects.

Assistance to students

The majority of struggling AIS students have a low GPA, indicating a weak performance in other units. Several support services, were put in place to assist these weaker students. These services are free of charge, and include the provision of peer assisted learning sessions, consultations with teaching staff, university study support, and online support materials. Peer assisted learning offers supplementary sessions run by students who have completed the unit with impressive results. Research studies indicate that students learn from peers by collaboratively studying and assessing other students' work, and that this learning is particularly improved when the assessment method includes feedback about products and processes (Bloxham and West 2004; Van Den Berg et al 2006). In addition, individual staff consultations are made available to students on at least four days a week. Furthermore, students were also encouraged to seek university support on studying, writing, referencing, and researching. Thus, it is hypothesized that:

H2: Assistance to students has a positive impact on overall students' learning experience in AIS subjects.

Transition to University

The majority of struggling AIS students have completed their first year accounting studies in a college affiliated with the university. They enroll in AIS subjects at their first or second semester of joining the University, and therefore have to adjust to larger class sizes and a higher degree of independent learning.

An article by Thompson and Geren (2002) addresses the transitional difficulties students face when moving to academia. They suggest that during this transition, students may have problems in adopting the Cognitive Behavioral Modifications required at university, prohibiting them from discovering “how to look at themselves as learners, to think about how they learn, to set goals, to actively apply strategies, and to monitor themselves as they advance towards a goal” (Thompson and Geren 2002, p. 402). This is especially acute, when considering that students nowadays are less prepared for university work, and tend to spend less hours studying than their predecessor (Nonis and Hudson 2006). Thus, it is hypothesized that:

H3: Late transition of students to university has a negative impact on overall students' learning experience in AIS subjects.

Assessment

AIS students are required to develop their skills in interpretation, recommendation, and justification when applying their knowledge into a real or hypothetical context using case studies to encourage critical thinking and highlight the units' relevance (Ramsden 2003). Most conceptual topics in the AIS subjects require a considerable degree of critical analysis and deliberation, as there is often no clear right or wrong answer, and therefore students' ability to make and justify recommendations is paramount. This clearly sets the AIS subject apart from most other accounting units that the students may have completed, as they are often much more 'structured'. Weaker students particularly, seem to master the structured component of the AIS units (e.g. definitions and characteristics), as it is prescriptive, and could be memorized, but are unable to apply this information to different case study scenarios where they would have to explain their rational, recommend courses of action, and provide justifications. Thus, it is hypothesized that:

H4: An assessment that requires critical thinking has a negative impact on overall students' learning experience in AIS subjects.

Communication skills

Most international students in the AIS subjects have a weak command of English. A large component of the continuing assessments and the final exam is usually based on case studies, where students are expected to communicate and apply their knowledge of theoretical concepts. Some students often face major difficulties in dealing with such material, possibly due to their poor English language. Research by Alfian and Othman (2005) on Business and Accounting students in a non-native English speaking country (Malaysia) found that Chinese students often excel and surpass their peers. This could be due to the different styles of teaching and/or could indicate that language proficiency is one of the major barriers.

The views on how to rectify this problem range from improving students' generic skills, including language English proficiency (e.g. Nathan and Dunn 1997) to the introduction of multilingual modules and facilities as the current systems could lead to discriminatory standards and inherent inequalities (Freidenberg 2002). As the latter suggestion is highly unlikely and currently impractical given the diverse linguistic backgrounds of students, a focus on language proficiency seems more reasonable, especially given the university's free assistance services. We therefore hypothesize that:

H5: Poor students' communication skills have a negative impact on overall students' learning experience in AIS subjects.

Appreciation of AIS

It has been communicated to the lecturers that some accounting students view the AIS subject as nonessential, as far as their accounting knowledge and career is concerned. Although technology is essential for most accounting tasks, students, especially those with no industry work experience, find it hard to foresee the extent of its importance, which is a major hindrance for students of an Asian background, who are motivated by a future career focus (Kember 2000). The AIS subjects offer students the chance of using an accounting software (QuickBooks or MYOB), in order to start building their experience in using such technology, and for them to relate some of the theoretical concepts discussed in class to their practical utility. Although students view this technical application as useful they do not seem to extend this perception to the unit as a whole.

This perception seems to lead to poor attendance at noncompulsory classes (e.g. lectures), poor participation in voluntary support activities (e.g. peer assisted learning), minimal contribution to class discussion (e.g. in tutorials), and a poor performance in assignments. There seems to be an ongoing staff commitment however, to pinpoint the issues leading to such perceptions and to realign them with the unit's learning objectives. Thus, it is hypothesized that:

H6: A favourable students' appreciation of AIS has a positive impact on overall students' learning experience in AIS subjects.

Unit Structure

Designing an effective AIS curriculum is a challenge for many academics as there is minimal authoritative guidance from international accounting bodies (Chayeb and Best 2005), and because of the novelty and non-standardization of the field's components (Barkman 1998; Borthick 1996). Particularly, there is no clear indication of what topics should be covered, the extent of coverage, and the sequence of topics.

Ramsden (2003) asserts that a good structure necessitates an educationally justifiable order of topics from the learners perspective and not from the subject experts' view point, and that such logical structure could be made relevant and enriched though the inclusion of real problems and cases for students. As such, the development of an AIS curriculum that is well structured and coherent, *from the students' perspective*, is essential in order to provide a favorable learning experience for students. Thus, it is hypothesized that:

H7: A coherent unit structure has a positive impact on overall students' learning experience in AIS subjects.

Pre-requisite knowledge in Information Systems

Students' conceptions of learning can be shaped by their prior learning experience and knowledge. Heterogeneity of the students' information systems backgrounds and the rapid change in the computing environment are two challenges affecting AIS education (Borthick 1996). Unlike the relative 'unanimity' associated with traditional accounting courses, AIS educators may find themselves undertaking substantial curriculum development to prepare students for careers in which accounting and technology are intertwined. The debate regarding the extent to which information systems should be incorporated into AIS subjects is still ongoing. However, Borthick (1996) asserts that it is unrealistic to think that acquiring AIS competencies can be delayed until the final year of accounting education. He points out that one year is simply not enough time for students to develop information systems expertise.

The current accounting curriculum dictates that students are required to take an introduction to information systems subject in their first year as pre-requisite to AIS subjects in their second year. However, dropping the first year IS subject requirement is currently being debated. Thus, pre-requisite knowledge in IS and the overall students' learning experiences is an important area of investigation. We then hypothesize that:

H8: Pre-requisite knowledge in IS has a positive impact on overall students' learning experience in AIS subjects.

Research Model

Based on the above discussion, a research model is proposed in Figure 1 below. To ensure the accuracy of the results, some issues which can be mediating factors to the overall students' learning experiences are included as control variables. The data collection was conducted with students enrolled in the two equivalent AIS subjects. Thus, type of subject should be controlled for. Other controls variables include type of student (international or local), English language (native speaker or non-native speaker), number of attempts in the subjects (first attempt or repeating) and transfer students (transfer from affiliated institutions or direct entry) were also controlled for.

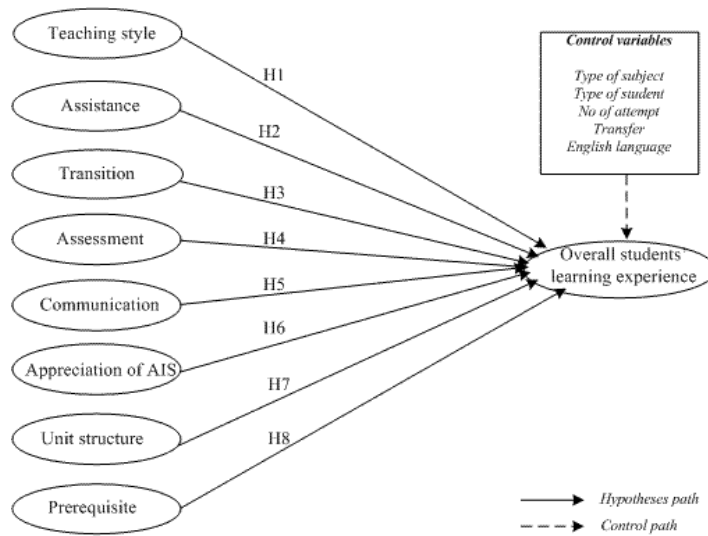


Figure 1: Research Model

METHODOLOGY

Quantitative empirical data were collected through a survey questionnaire in two phases. Given the exploratory nature of the research, the survey instrument was subjected to pilot testing, where data were collected from 120 students out of the approximately 1200 student cohort in semester 2, 2008. Data collected were analyzed using factor analysis and reliability testing via SPSS v.13 and then Structural Equation Modeling (SEM) with Partial Least Squares (PLS) technique was adopted to test the validity and reliability of the measurement model. The original 100 questions were subsequently reduced to 51 questions in the main survey instrument.

The first 13 questions of the refined survey collected demographic data, for example, whether the student was local or international, whether English was their first language, their study pattern etc. The remaining 38 questions ask about students’ perception toward each of the factors mentioned above and their overall learning experience in the AIS subjects. There perceptions were measured by using a five point Likert-scale with 1 being “strongly disagree” and 5 being “strongly agree”. The main data collection was conducted during the last week of lectures. About 1200 survey questionnaires were distributed to students enrolled in the AIS subjects. The participants were given the survey and allowed class time to complete their answers. All participants were informed that participation in this study was voluntary and all the responses were anonymous. 618 surveys were completed and returned. Table 1 summarizes the demographics of the respondents.

The model was then operationalized and analyzed using PLS-graph Version 3.0. The PLS approach was preferable to SPSS because it provides better prediction capability and can be used for the analysis of a high complexity model with small sample sizes compared to a large number of independent variables. The results from the PLS analysis are presented in the next section.

Questions		Frequency	Percentage
When did you commence your studies at this University?	Before 2006	17	2.8
	2006	61	9.9
	2007	195	31.6
	2008	345	55.8
Did you transfer from an affiliated collage or TAFE?	Affiliated X	421	68.1
	TAFE	26	4.2
	Other institutions	40	6.4
	None Transfer	131	21.2
Are you a local or international student?	Local	98	15.9
	International	520	84.1
What is your gender?	Male	262	42.4
	Female	356	57.6
Where did you complete your high school studies?	Australia	150	24.3
	New Zealand	4	0.6
	Asia	449	72.7
	Africa	3	0.5
	North America	3	0.5
	Central/South America	1	0.2
	Europe	7	1.1
	Missing value	1	0.2
What is your study pattern?	Full-time	595	96.3
	Part-time	23	3.7
This is my __attempt of this (or an equivalent) unit	First	488	79
	Second	117	18.9
	Third	3	2.1
Which degree program are you pursuing?	Accounting	588	95.1
	Non-Accounting	30	4.9

Table 1: Respondent’s Demographics Data

ANALYSIS OF RESULTS

Measurement model

To ensure the accuracy of the structural model analysis, the validity and reliability of the scale developed need to be tested. Table 2 presents the results obtained via the bootstrapping procedure including PLS loading, T-statistics, Significance level, Composite Reliability and Average Variance Extracted (AVE). The results suggest that our measurement model demonstrates sufficient discriminant validity and internal consistency. Chin (1998) suggests that the loading should be greater than 0.707. All the reflective scales demonstrated acceptable performance above the minimum value of composite reliability, which is greater than 0.7. Moreover, the standard for reliability dictates that the AVE scales should exceed 0.5, indicating that “50 percent or more variance of the indicators should be accounted for” (Chin 1998, p.321). It can be seen that all the scales performed acceptably on this standard. Following confirmation of the validity and reliability of the measurement model, the overview result of the structural model is presented below.

Constructs	Items	PLS loadings	T-statistics	Significance level	Composite Reliability	AVE
Overall students' learning experience	Overall1	0.8283	59.7588	0.01	0.930	0.726
	Overall2	0.8612	76.6165	0.01		
	Overall3	0.8475	64.3706	0.01		
	Overall4	0.8563	72.0550	0.01		
	Overall5	0.8677	73.9025	0.01		
Teaching style	Teach1	0.8338	42.7591	0.01	0.902	0.696
	Teach2	0.8849	79.9279	0.01		
	Teach3	0.7866	29.7275	0.01		
	Teach4	0.8295	53.9198	0.01		
Assistance	Assit1	0.8226	33.7020	0.01	0.896	0.684
	Assit2	0.8393	44.0903	0.01		
	Assit3	0.8668	47.6936	0.01		
	Assit4	0.7763	24.5012	0.01		
Transition	Transition1	0.9774	6.5444	0.01	0.958	0.850
	Transition2	0.8664	5.0420	0.01		
	Transition3	0.9720	6.4595	0.01		
	Transition4	0.8664	5.0420	0.01		
Assessment	Assessment1	0.8627	5.1893	0.01	0.927	0.718
	Assessment2	0.9012	4.0285	0.01		
	Assessment3	0.8506	4.1628	0.01		
	Assessment4	0.8268	4.2752	0.01		
	Assessment5	0.7907	3.5601	0.01		
Communication skill	Comm1	0.9009	6.8993	0.01	0.945	0.812
	Comm2	0.9101	7.0704	0.01		
	Comm3	0.9149	6.9881	0.01		
	Comm4	0.8780	5.6114	0.01		
Appreciation of AIS	Perception1	0.8967	69.2877	0.01	0.946	0.815
	Perception2	0.9218	91.8785	0.01		
	Perception3	0.9287	75.4401	0.01		
	Perception4	0.8621	32.5519	0.01		
Pre-requisite	Prerequisite1	0.9078	70.5846	0.01	0.954	0.839
	Prerequisite2	0.9131	90.9195	0.01		
	Prerequisite3	0.9112	92.4693	0.01		
	Prerequisite4	0.9310	136.2202	0.01		
Unit structure	Structure1	0.8055	35.4933	0.01	0.882	0.651
	Structure2	0.8302	58.8328	0.01		
	Structure3	0.7829	31.6077	0.01		
	Structure4	0.8084	34.8534	0.01		

Table 2: Statistical Outcomes for Measurement Model

Structural model

Figure 2 presents the results of the structural model generated by the PLS Graph. The predictiveness of the model can be assessed by the R^2 of the dependent constructs. The results show that R^2 of the overall students' learning experiences is 0.540, which indicates that all the latent variables accounted for 54 percent of the variance of the construct.

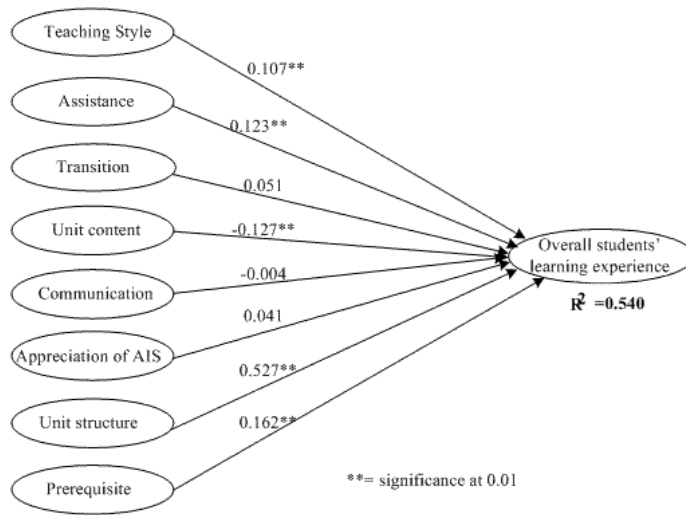


Figure 2: Structural model results

Constructs	Actual Effect	Path Coefficient	Observed T-statistics	Significance level
Overall students' learning experience				
Teaching style	+	0.107	3.4227	0.01
Assistance	+	0.123	3.8769	0.01
Transition	+	0.051	1.4008	Not significant
Assessment	-	0.127	2.1135	0.01
Communication	+	0.004	0.0942	Not significant
Appreciation of AIS	+	0.041	1.0766	Not significant
Unit structure	+	0.527	4.5731	0.01
Prerequisite	+	0.162	13.6523	0.01

Table 3: Summary of Path Coefficient Test Results

Table 3 presents the statistical outcomes of examining the hypotheses. The statistics obtained through the bootstrapping procedure (that is the actual effect, path coefficient, observed T-statistics and significance level) were reported. The results of this study supported hypotheses 1, 2, 4, 7 and 8. Among these variables, unit structure contributes the most to the overall students' learning experience (0.527 of path coefficient), followed by prerequisite (0.162), assessment (-0.127), assistance (0.123) and teaching style (0.107). This indicates that teaching style, assistance to students, unit structure and pre-requisite knowledge of IS have a positive influence on the overall students' learning experience in AIS subjects. Conversely, the

critical thinking assessment has a negative influence on the students' learning experience. This implies that the more students feel it is difficult to perform case study analysis and interpretation, the worse their learning experience. On the other hand, the results reject hypotheses 3, 5 and 6. This indicates that transition, communication skill and appreciation of AIS do not have a statistically significant influence on their overall learning experience.

Furthermore, the structural model with control variables revealed that all the control variables had no effect on the overall students' learning experiences. This implies that the result of including the variables in the structural model did not alter any of the significance levels of the path coefficient in the structural model.

DISCUSSION AND CONCLUSION

This research considers AIS education and reflects upon the challenges that many students, particularly those undertaking accounting studies, may face when studying AIS concepts. Based on the authors' experiences in teaching AIS, a review of the literature, and preliminary pilot testing, hypotheses were formulated and a research model and survey instrument developed and refined. Subsequently, data collection was undertaken. These data were analyzed using the SEM with PLS technique. The results of the analysis highlight the following principal points:

First, it is evident from the analysis that the most important factor influencing students' perception of the AIS units' overall learning experience is unit structure. It is therefore paramount for instructors and curriculum developers. Students' perceptions are often unconsidered or trivialized when undertaking curriculum reviews, where the primary focus seems to be based on the perceptions of academics, university management and accreditation organizations. This might lead to what Rodrigues (2004, p. 179) describes as:

"...students' needs and the course's needs sometimes do not match. This can sometimes result in uncertainty and unpredictability for students, which can lead to frustration. Furthermore, teaching programs must often have to be designed to accommodate the attainment of the organization's goals, and such designs are sometimes not congruent with students' preferred learning techniques."

We therefore argue that student and their needs and perceptions should be seriously considered in curriculum design and review, and where such needs and perceptions might be seen as "unrealistic" or "unreasonable", designers/reviewers must address such perceptions through a transparency in make rationalizations for course structures available to students as well as informing students in classes early on in the semester about the underlying reasoning behind these structures. This is particularly crucial when introducing non-traditional courses such as AIS, as failing to do so may well contribute to the students' challenges and poor outcomes.

Second, the results of our analysis reinforce the importance of pre-requisite knowledge in IS, which is inline with previous studies (Barkman 1998; Borthick 1996). Curriculum developers and reviewers need to also take into consideration the students' background knowledge and experience, which the students ranked second in importance. Given the structural issues and the fact that there are no authoritative guidelines on what should be included in an AIS unit this becomes particularly important. It is essential to differentiate herein between IT units as prerequisites of AIS courses and those that take an IS or a Business Information Systems (BIS) perspective. The earlier units are primarily concerned with the development of IT artifacts, while the latter contextualize such artifacts in a business domain and consider the social and organizations aspects associated with their use for efficiency and competitive advantage. It is therefore important to focus on building IS and BIS competencies that are relevant to accounting students and that optimally prepare them to critically engage with AIS theory and practice.

Third, a critical outlook could be then developed in earlier prerequisite units, and would assist in the development of a questioning perspective which many of the international cohorts might not be acquainted with. This will allow for a gradual infusing of western teaching styles to compliment the rich experience that students bring from their own backgrounds not only via interaction with the instructors but also through their interaction with their peers in what is a global classroom (Bloxham and West 2004; Van Den Berg et al 2006), while taking into account sensitive ethnic and gender issues, due to the proven differences in values, perceptions, and sensitivities arising from students' cultural backgrounds (Woszczyński et al. 2006).

Fourth, it is quite interesting that students' perceptions on assessment were significant but negative (indicating that students find assessments that involve critical thinking, recommendation, and justification unfavorable), as many of them may not be acquainted with such assessments neither from their schooling background (especially international students from a South East Asian heritage) nor from other introductory accounting units. This has been the cause of stress to many of the students as the certainty of having what is essentially a binary outcome with clear right and wrong is not always available in the AIS

curriculum. Pre-requisite units that incorporate critical thinking and reflection are therefore very important to nurture the students' critical minds and encourage a reflective and deep approach to learning.

Fifth, it is essential to maintain support services to assist student in their transition, as well as provide a forum where students could have one-on-one communication with instructors to raise any issues and clarify their understanding, perceptions, and expectations. The results of the analysis demonstrate that the more support services that instructors and the university offer to students the better their perceived overall learning experience. This issue is particularly important for this study because many students have low GPAs, and according to the descriptive analysis, 18.9 percent of students are repeating these subjects for the second time, while 2.1 percent are in their third attempt.

LIMITATIONS AND FUTURE RESEARCH

The study was conducted in one university context so caution should be considered regarding generalizing the results to other contexts. Future research could further contrast or validate the findings of this research in multiple tertiary education institutions in various countries. It is worthwhile noting herein that our research context was dominated by a majority of international students, and results may differ for institutions that cater for predominantly local cohorts of native-English speaking students.

Moreover, given the personal and interpersonal nature of learning, interpretive one-on-one interviews could add much richness to the reasons behind the perceptions highlighted in this research, particularly when the students' rationalization of their perceptions are investigated. Of particular interest is why late transition to university, communication skills, and appreciation of AIS were all insignificant for the students' learning experience.

It is the authors' opinion that the ultimate relevance of this research resides in making AIS learning a rich and enjoyable experience to students' of the information age. It is therefore hoped that this paper will initiate a discussion which could eventuate in real improvements in the AIS curriculum.

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