Technology readiness, internet self-efficacy and computing experience of professional accounting students

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Abstract

Purpose – This study aims to assess the state of technology readiness of professional accounting students in Malaysia, to examine their level of internet self-efficacy, to assess their prior computing experience, and to explore if they are satisfied with the professional course that they are pursuing in improving their technology skills.

Design/methodology/approach – A questionnaire was developed to collect data. The questionnaire was posted to the first 500 students registered for the Malaysian Institute of Certified Public Accountants' advanced stage examination in December 2005. A total of 110 usable questionnaires were used for data analysis.

Findings – Based on the technology readiness index of Parasuraman and Rockbridge Associates Inc., the survey found that professional accounting students were neither highly techno-ready nor highly techno-resistant towards new technologies. The respondents were then classified into five categories, explorers (5 percent), pioneers (42 percent), skeptics (38 percent), paranoids (13 percent), and technology laggards (2 percent). Overall, the survey found that the respondents had moderate level of internet self-efficacy and computing experience.

Practical implications – This study provides important insights for professional accounting bodies to intensify information communication technology (ICT) integration into accounting education curriculum and assessment policies. Accounting educators need to be innovative in teaching and in assessment strategies to integrate ICT effectively in campus.

Originality/value – Scholarly study of professional accounting students and ICT is scant; this paper emerged to fill up a knowledge gap.

Keywords Accounting, Students, Communication technologies, Internet, Malaysia

Paper type Research paper

Introduction

The use of information and communication technology (ICT) in accounting education continues to develop in higher learning institutions and tuition providers of professional accounting education. Notably, professional accounting bodies such as the Association of Chartered Certified Accountants (ACCA) and public universities in Malaysia are aggressively promoting the use of web-based learning or electronic learning (e-learning) for continuous professional development and distance education. However, Pituch and Lee (2006) asserted that the benefits of an e-learning system will

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not be maximized unless learners use it. Indeed, the success of the e-learning will hinge not only on the users' technology acceptance of an e-learning system, but also their state of technology readiness, internet self-efficacy and prior ICT experience, among others.

Much studies had been conducted to examine accounting students' interaction with e-learning and ICT in the developed nation (for example, Marriott *et al.*, 2004; Concannon *et al.*, 2005; Becker *et al.*, 2007). In contrast, very little studies had been carried out to examine accounting students' and ICT from the developing nation like Malaysia. In particular, there had been little published study on professional accounting students' state of technology readiness, internet self-efficacy and prior ICT experience, let alone on their acceptance and usage of an e-learning system. Specifically, there are several concerns. What is the state of technology readiness of professional accounting students in a developing country like Malaysia? What is the level of internet self-efficacy? Do professional accounting students have adequate computing and internet experience? Are they satisfied with the professional courses that they are pursuing in improving their technology/software skills? Do they want to use e-learning? Hence, this study aims to address some of the concerns. The research objectives are presented next.

Research objectives

This study aims to assess the state of technology readiness of professional accounting students in Malaysia; to examine their level of internet self-efficacy; to assess their ICT skills and experience ,and to explore if they are satisfied with the professional course that they are pursuing in improving their technology/software skills.

Literature review

Parasuraman and Rockbridge Associates, Inc. developed the technology readiness index (TRI) to measure technology readiness. Parasuraman (2000) defined technology readiness as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (p. 308). Empirical studies suggesting that people's beliefs about technology have both positive and negative facets, and can be categorized into four distinct technology readiness dimensions, namely, optimism, innovativeness, discomfort, and insecurity (Mick and Fournier, 1998; Parasuraman and Colby, 2001). The optimism dimension refers to a positive view of technology and beliefs in the benefits of technology in increasing job efficiency and enhancing people's lives at work and at home. The innovativeness dimension refers to the extent to which a person believes that he or she is a thought leader, and at the forefront of trying out new technology-based products/services. Discomfort refers to a perceived lack of control over technology and a feeling of lack of confidence in using the new technologies properly. Insecurity refers to distrust of technology-based transactions and skepticism about their ability to work properly. Though, insecurity is somewhat related to the discomfort dimension, Parasuraman and Colby (2001) asserted that this facet differs from discomfort, as it focuses on specific aspects of technology-based transactions rather than on a lack of comfort with technology in general. The first two technology readiness dimensions, "optimism" and "innovativeness" are the "contributors" that may increase an individual's technology

readiness, while the other two dimensions; "discomfort" and "insecurity" are "inhibitors" that may suppress technology readiness (Parasuraman and Colby, 2001).

The combination of scores on the four technology readiness dimensions represents a person's overall technology readiness. TRI is a multiple-item scale with sound psychometric properties that can be used to gain an in-depth understanding of the readiness of technology customer (both internal and external) to embrace and interact with technology, especially computer/internet-based technology (Parasuraman and Colby, 2001). Several empirical studies provide the insight that the TRI scale is capable of capturing the relationship between technology readiness and technology usage behaviors (for example, Colby and Albert, 2003; Farby, 2004; NTRS, 1999, 2000, 2001; Parasuraman and Colby, 2001). It is worthy to note here that Parasuraman and Colby (2001) stressed that technology readiness is an overall state of mind and not a measure of technical competency or ability.

Based on individual's technology readiness score and the TRI, Parasuraman and Colby (2001) further classified technology customers into five technology readiness segments, namely, explorers, pioneers, skeptics, paranoids, and laggards. They stated that "explorers" are highly optimistic and innovative; they score high in technology readiness and are highly motivated and fearless to try new technology once it appears in the market. "Pioneers" are relatively early adopters of new technology but are simultaneously held back by inherent discomfort and insecurity; they are innovative yet cautious. "Skeptics" are fairly techno-ready; they are lowly motivated and need to be convinced of the benefits of using the emerging technology. "Paranoids" are the insecure; they are later adopters of new technology. Though paranoids are convinced of the benefits of the technology, at the same time, they are concerned about the risks and barriers of technology adoption. "Laggards" are the resistant ones, who are likely the last adopters of new technology; and they may never use new technology unless they are forced to do so. Prior studies found that explorers and pioneers are high in technology readiness and tend to embrace new technology earlier than the others (e.g. Parasuraman and Colby, 2001; Lai *et al.*, 2005).

Meanwhile, self-efficacy is defined as the belief that one has the capability to perform a particular behavior (Bandura, 1986). In particular, computer self-efficacy measures one's confidence in mastering a new technology or software with certain degree of confidence (Compeau and Higgins, 1995). When computer self-efficacy is high, one believes a high probability exists that one will be successful using a technology or software. While low self-efficacy suggests that a limited belief that one will accomplish the task on his/her own. Whilst, internet self-efficacy focuses on what an individual believes he or she can accomplish online now or in the future. It is the belief that one can establish, maintain and utilize internet effectively over and above basis personal computer (Ma and Liu, 2005). Ma and Liu argued that internet self-efficacy is more than a judgment of one's capability of applying internet skills; rather, it is a measure of individual specific skills in using an internet browser.

Marriott *et al.* (2004) examined accounting undergraduates in two universities in the UK. They found accounting students' use of accounting applications such as spreadsheets and software packages is dependent on the integration strategy of the students' institutions. They also found a significant increase in students' voluntary use of the internet and e-mail, but the UK students are reluctant to consider being taught via the internet. A primary concern was with the threat of decreased social contact and

the potential isolation of learning alone. In Australia, despite the move towards online learning for both on campus and distance education, Becker *et al.* (2007) found that a significant percentage of students in Australia indicated that they do not want all course delivery to be online.

The above literature review provides the insights to adapt TRI of Parasuraman and Rockbridge Associates, Inc. (1999) to measure technology readiness of professional accounting students in Malaysia, and to adapt studies of Compeau and Higgins (1995) as well as Ma and Liu (2005), to study students' internet self-efficacy. The research methodology is presented next.

Research methodology

A postal survey questionnaire was developed to collect data. Section A of the questionnaire gathered demographic information about the respondents. In section B, 36 questions were adapted from the technology readiness index (TRI) of Parasuraman and Rockbridge Associates, Inc. (1999) with written permission. In section C, 12 questions were purposefully designed to gauge the respondents' computing and internet experience. In section D, six questions were adapted from Compeau and Higgins (1995) and Ma and Liu (2005) to assess professional accounting student's level of confidence in using a web-based/e-learning system.

The questionnaire was pre-tested on eight professional accounting students before mailing it out via Malaysian Institute of Certified Public Accountants (MICPA). The questionnaire with a return stamped, self-addressed envelope enclosed was posted to the first 500 students registered for the MICPA's advanced stage examination in December 2005. Out of the 500 posted, 15 were returned as undeliverable. A total of 119 questionnaires were received, and of these, nine were partially completed and unusable for data analysis. Hence, 110 questionnaires were usable, which gives rise to a response rate of 22.7 percent (110/485). Note that the response rate was rather low, nonetheless, it compares well with surveys conducted in Malaysia (covering the years 1990-2002) that were published in journal of *MICPA*, which generally reported response rates of 20-25 percent (cited in Veerinderjeet, 2003, p. 195).

In view that non-response bias might affect the validity and generalization of the result, the potential non-response bias was tested by using one of the approaches recommended by Armstrong and Overton (1977). In this study, the mean scores for the research variables for the first 30 early responses and the last 30 responses were compared. The *t*-test results had shown that no significant difference at 1 percent significant level for all the research variables for these two groups, and therefore, it can be concluded that non-response bias is not a serious problem in this study.

Data analysis

The respondents' profiles are presented in Table I. The survey respondents came from all over Malaysia, notably, majority of the respondents were from Kuala Lumpur (46.4 percent) and Selangor Darul Ehsan (40 percent). The results reflect the reality, as most of the tuition providers were located in these two states in Malaysia. About 70 percent of the respondents were females. The majority was aged between 21-25 years old (62.7 percent). Just 33 percent of the survey respondents were pursuing full time study, whilst 67 percent were pursuing their studies on a part time basis. This finding

		Frequency	Percentage (%)
A. By state			
Kuala Lumpur/Wilayah Persekutuan		51	46.4
Selangor Darul Ehsan		44	40.0
Pulau Pinang		6	5.5
Terengganu		2	1.8
Kedah		2	1.8
Perak		1	0.9
Sarawak		1	0.9
Johor		1	0.9
Melaka		1	0.9
Pahang		1	0.9
B. Demographic characteristics			
Gender	Male	33	30.0
	Female	77	70.0
Age	21-25 years old	69	62.7
	26-30 years old	37	33.6
	Above 30	4	3.6
Mode of study	Full time	36	32.7
	Part time	74	67.3
Total		110	100

Table I.
The respondents' profiles

indicates that most of the professional students who pursued advanced stage of MICPA examination were doing it on a part time basis.

Technology readiness

At the outset, the Cronbach's alpha was computed to determine the reliability of 36 measurement items used in measuring the four technology readiness dimensions. Table II indicates that the Cronbach's alpha for the four TR dimensions ranged from 0.58 to 0.75, which demonstrate a moderate level of reliability, this result shows satisfactory internal consistency of the measurement scales.

Table II shows that the survey respondents were optimistic towards new technologies with a mean score of 3.90 on the five-point scale (significant at $p < 0.001$).

TRI dimension	Mean	Standard deviation	Minimum	Maximum	Cronbach's alpha[b]
Optimism (10)[a]	3.90*	0.44	2.50	4.70	0.75
Innovativeness (7)	3.12*	0.53	1.29	4.29	0.58
Discomfort (10)	3.44*	0.39	2.20	4.60	0.62
Insecurity (9)	3.85*	0.46	2.11	5.00	0.72
Overall TRI[c]	2.93*	0.30	2.33	3.61	Not applicable

Notes: All mean values are on a five-point scale, anchored on 1 (strongly disagree), 2 (slightly disagree), 3 (neutral), 4 (slightly agree) and 5 (strongly agree); *Significant at $p < 0.001$; [a]Parenthesis denotes the total measurement items for each TRI dimensions; [b]The Cronbach's alpha measures the internal consistency of the measurement scales for each TRI dimensions; [c]The overall TRI score for each respondent was obtained by averaging the scores on the four dimensions, i.e. Optimism+Innovativeness+(6-Discomfort)+(6-Insecurity)

Table II.
Scores on TRI and its component dimensions

However, they had a moderate level of innovativeness (mean score of 3.11 on the five-point scale, significant at $p < 0.001$), and experienced some degree of discomfort with new technologies (means score of 3.43, significant at $p < 0.001$). By and large, the respondents were wary about the security of internet technology with a mean value of 3.85 on the five-point scale (significant at $p < 0.001$). Overall, the mean for the TRI is 2.93 (significant at $p < 0.01$), note that it is around the neutral range. Thus it indicates that as a group, professional accounting students were neither highly techno-ready nor highly techno-resistant. The minimum TRI value was 2.33 and the maximum was 3.61, with the range of TRI values being 1.28.

Technology readiness segment

The combination of scores on the above four technology readiness dimensions represents a person's overall technology readiness (Parasuraman, 2000; Parasuraman and Colby, 2001). Based on the TRI, the respondents are analyzed into five different segments, namely explorers, pioneers, skeptics, paranoids and laggards. Figure 1 presents the findings.

Figure 1 shows that about 6 percent of the respondents were explorers; this group was high in technology readiness and highly motivated and fearless. Parasuraman and Colby (2001) asserted that explorers are an easy group to attract when a new technology is introduced; and they will comprise the first wave of customers. The survey found approximately 41 percent of the respondents were pioneers, who desire the benefits of the new technology but were more practical about the difficulties and obstacles involved. Pioneers need help in making the technology work for them and require some degree of assurance, and were usually the next group in line to try new technology. Nearly 38 percent of the survey respondents were skeptics, who did loathe technology, but needed to be convinced of the benefits of using the emerging technology. Once they were convinced of the benefits of the technology, adoption came readily because there were a few reasons to hold back. About 13 percent of the respondents were paranoids, who were convinced of the benefits of the technology but were concerned about the risks, discomfort and insecurity. Just 2 percent of the respondents were technology laggards who may never use new technology unless they were forced to do so, according to Parasuraman and Colby (2001).

Internet self-efficacy

This study found professional accounting students were moderately confident in using a web-based/e-learning system on their own, with a mean score of 3.87, significant at $p < 0.01$ (see row 8, Table III). The respondents indicated that they would be slightly

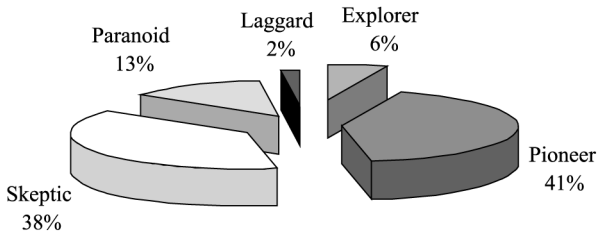

Figure 1.
Technology readiness segment

Table III.
Internet self-efficacy

I am confident of using web-based learning/e-learning system …	NC (%)	SNC (%)	N (%)	SC (%)	VC (%)	Mean *	SD
(i) … if I had seen someone else using it before trying it myself	1.8	7.3	23.6	48.2	19.1	3.75	0.911
(ii) … if I could call someone for help if I got stuck	0.9	5.5	20.0	48.2	25.5	3.92	0.869
(iii) … if someone else had helped me get started	0.9	6.4	16.4	52.7	23.6	3.92	0.858
(iv) … if I had just the built-in help facility for technical assistance	2.7	11.8	20.9	47.3	17.3	3.65	0.992
(v) … if someone could showed me how to do it first	0.9	7.3	14.5	49.1	28.2	3.96	0.898
(vi) … if I had used similar packages before this one to do the same job	1.8	6.4	12.7	46.4	32.7	4.02	0.938
Overall						3.87	0.726
Reliability (Cronbach alpha for the above six statements) = 0.88							

Notes: All mean values are on a five-point scale, anchored on 1 = NC (not at all confident); 2 = SNC (slightly not confident); 3 = N (neutral); 4 = SC (slightly confident) and 5 = VC (very confident); All mean values were significant at $p < 0.001$

more confident if they had used a similar technology or software package before, or if someone could show them how to do it first.

Prior ICT experience: computing skills and internet experience

In order to assess professional accounting students' computing skills and internet experience, ten questions were designed to gauge their usage of ICT on campus and at home. Table IV reports that although the majority of respondents had mastered Microsoft Word and Microsoft Excel, they, nevertheless had not mastered any accounting software packages. The possible explanations could be due to lack of practical training, as the current professional accounting education curriculum does not incorporate accounting software applications across courses. Notably, the respondents also lacked the skills in using statistical packages such as SPSS (with a mean score of 2.04 on a five-point scale, significant at a 1 percent level). The results as presented in panel B of Table IV indicate that at the time of study, the respondents had some experience with the internet such as e-mail, online banking and ticketing; nonetheless, they lacked the online stock trading experience.

Satisfaction with the professional course in improving student's technology skills

Three questions were designed to gauge if the respondents students were satisfied with the professional course that they were pursuing in improving their technology skills. The results as presented in Table V indicate that the respondents were indifferent about this issue. They were neither very dissatisfied nor very satisfied.

Limitations

This study has several limitations. Firstly, this is a cross-sectional survey. Data was collected at a particular point of time; as such the respondents' state of mind might change overtime. Secondly, the sample size is relatively small, thus might not be sufficient to represent the population. Bearing in mind of these, care should be taken in interpreting and generalizing the findings.

Conclusion

Overall, the survey found professional accounting students were neither highly techno-ready, nor highly techno-resistant, and they exhibited moderate level of internet self-efficacy. Some respondents appeared to be "explorers" (6 percent) and "pioneers" (41 percent). Parasuraman and Colby (2001) asserted that "explorers" and "pioneers" are thought leaders and they are the early majority who would adopt new technology once it appears in the market. Hence, they can be used as the change agent to accelerate the diffusion of new technology, such as e-learning system.

The survey found usage of ICT, such as e-mail and the internet, was quite widespread among the professional accounting students in Malaysia. Nonetheless, the professional accounting students had not mastered the applications of accounting software. Related to this, they were neither very satisfied nor very dissatisfied with the professional course in improving their technology skills. This could be due to the fact that at the time of study, hands-on computing and accounting software courses were not a compulsory requirement in the professional accounting education's curriculum. Hence, most of the tuition providers did not formally exposed professional accounting

Table IV.
Prior ICT experience: computing skills and internet experience

	Slightly disagree (%)	Strongly disagree (%)	Neutral (%)	Slightly agree (%)	Strongly agree (%)	Mean	SD
Panel a: computing skills							
I have mastered Ms word	Nil	0.9	6.4	53.6	39.1	4.30**	0.671
I have mastered Ms Excel	Nil	0.9	7.3	51.8	40.0	4.30**	0.685
I have mastered Ms Power point	0.9	2.7	22.7	49.1	24.5	3.94**	0.816
I have mastered database management systems	8.2	41.8	40.9	8.2	0.9	2.52**	0.798
I have mastered accounting packages	4.5	11.8	33.6	37.3	12.7	3.40**	1.008
I have mastered a statistical package, i.e. SPSS	20.9	33.6	31.8	10.9	2.7	2.41**	1.025
Panel B: internet experience							
I have the experience in using e-mail for correspondence	1.8	Nil	3.6	29.1	65.5	4.58**	0.655
I have the experience in using online banking facilities	8.2	10.9	23.6	22.7	34.5	3.65**	1.282
I have the experience in online booking and ticketing	10.9	13.6	22.7	30.9	21.8	3.39*	1.271
I have the experience online stock trading	33.6	35.5	25.4	2.7	1.80	2.04**	0.938

Notes: All mean values are measured based on a five-point scale, anchored on 1 (strongly disagree); 2 (slightly disagree); 3 (neutral); 4 (slightly agree); 5 (strongly agree); *Significant at $p < 0.01$; **Significant at $p < 0.001$

How satisfied were you with the professional course that you are pursuing to …	VD (%)	SD (%)	N (%)	SS (%)	VS (%)	Mean	SD
(a) … improve your technology/software skills	3.6	16.4	41.8	33.6	4.5	3.19**	0.893
(b) … help you used technology/software in future workplace	3.6	15.5	37.3	35.5	8.2	3.29**	0.952
(c) … teach you new technology/software skills	3.6	19.1	40.9	30.9	5.5	3.15*	0.921

Notes: All mean values are on a five-point scale, anchored on 1 = VD (very dissatisfied); 2 = SD (slightly dissatisfied); 3 = N (neutral); 4 = SS (slightly satisfied) and 5 = VS (very satisfied); *Significant at $p < 0.01$; **Significant at $p < 0.05$

Table V.
Satisfaction with the professional course in improving technology skills

students to any formal computing courses, let alone accounting software applications. This study suggests that professional accounting bodies and the tuition providers can not assume that their students will acquire the requisite computing and accounting software skills elsewhere. Pragmatically, professional students need to be taught how to use the internet, accounting software and e-learning system effectively in campus. Therefore, it is imperative for professional bodies such as MICPA to develop more positive ICT integration strategies into the professional accounting education curriculum and assessment policies; and to specifically request tuition providers and institution to integrate ICT in the course of study.

Future study could be conducted on a larger sample in order to give a more complete picture. Comparative studies could be conducted on other professional accounting students, such as students sitting for the Association of Chartered Certified Accountants (ACCA) and Institute of Chartered Accountants in England and Wales (ICAEW) examinations. Future studies could also be conducted to examine professional accounting students, for example, the ACCA students located across the five continents.

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