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Internet as an Influencing Factor of Teachers' Confidence in Using ICT

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Abstract

In an effort to facilitate greater integration of information and communication technology (ICT) within classroom, the Malaysian government has provided intensive and continuous ICT training for teachers to undertake. One of the three major areas being highlighted by the Ministry of Education (MOE) is to use ICT as teaching and learning tools in education. Nevertheless, the MOE reported that many students still have poor skills in the core subjects at schools. One of the root causes identified was majority of teachers are still less inclined toward embracing changes to incorporate ICT into their teaching. This study attempted to determine whether internet is a factor that influences teachers' perception toward their own ICT skills. A survey was completed by 84 school teachers who taught IT subjects from various schools in Penang, Malaysia. The results showed that in general, the teachers were quite confident in demonstrating their ICT skills while delivering the lessons. Furthermore, it has also been found that those who could access internet at both home and school were more confident in their professional ICT usage. This paper addressed which facet of internet usage is a possible key in facilitating teacher's confidence towards using ICT professionally.

Keywords: information and communication technology, internet, teachers, confidence, education

Abstrak

Sebagai satu usaha untuk menjayakan aktiviti penggabungan bidang Teknologi Komunikasi dan Maklumat (ICT) di dalam kelas pembelajaran, kerajaan Malaysia telah menyediakan latihan ICT yang intensif dan berpanjangan untuk para guru. Salah satu daripada tiga bidang utama yang ditekankan oleh Kementerian Pelajaran Malaysia (KPM) adalah untuk menggunakan ICT sebagai alat pengajaran dan pembelajaran dalam bidang pendidikan. Walau bagaimanapun, KPM melaporkan bahawa masih ramai pelajar yang lemah dalam mata pelajaran teras di sekolah. Salah satu punca yang telah dikenal pasti adalah masih ada majoriti guru yang kurang cenderung ke arah usaha untuk menggabungkan ICT dalam pengajaran mereka. Kajian ini cuba menentukan sama ada internet

merupakan faktor yang mempengaruhi persepsi guru terhadap kemahiran ICT mereka. Satu kaji selidik telah dilakukan terhadap 84 guru sekolah yang mengajar subjek IT dari pelbagai sekolah di Pulau Pinang, Malaysia. Hasil kajian menunjukkan bahawa secara amnya, guru tersebut berasa agak yakin dalam memperlihatkan kemahiran ICT mereka ketika menyampaikan pelajaran. Tambahan pula, adalah didapati bahawa mereka yang boleh mengakses internet di rumah dan di sekolah adalah lebih yakin dalam penggunaan ICT profesional mereka. Kertas kerja ini mengkhususkan aspek penggunaan internet sebagai suatu kunci yang mungkin dalam usaha meningkatkan keyakinan guru menggunakan ICT secara profesional.

Kata kunci: teknologi komunikasi dan maklumat, internet, guru, keyakinan, pendidikan

Introduction

Since the past decades, ICT has become a significant factor in development throughout the world, with a profound impact on various fields, such as political, economic, and social sector. With the prevalence ICT tools, such as internet, e-mails, blogs, and many more, teaching and learning have become an enlivened yet productive processes in the education system. Schools are looking up for ICT solutions that provide learning supports with extensive technological resources. This phenomenal culture has caused a high adoption of ICT, which also has substantially changed the format of education system.

However, the real process of integrating ICT into education system is indeed a complexity which has to consider various educational aspects, such as curriculum and pedagogy, institutional readiness, teacher competencies and long-term financing (Tinio, 2003). In Malaysia, Chan (2002) reported five strategies that the ministry needs to implement in achieving the objectives of using ICT in education. The strategies include preparation of sufficient ICT infrastructure, roll-out of ICT curriculum, upgrades of ICT knowledge and skills, use of ICT in educational management, and maintenance of ICT equipments. To cope with such radical changes, not only students are expecting for supports of the new learning methodologies, teachers also need to be equipped with ICT literacy that meets the current demands.

Yet, questions remain as to whether teachers are fully ready and confident in developing their ICT literacy and learning how to use ICT

professionally. The value of confidence should not be taken lightly. For example, Hennessy, Ruthven and Brindley (2005) reported that most teachers perceived that the real benefits of ICT will only be felt when confidence is increased. Thus, it is crucial to identify what factors could possibly raise teachers' confidence in using ICT as their teaching aid. Among of the possible factors identified were gender (Jamieson-Proctor et al., 2006), support and collective experiences (Hennessy Ruthven and Brindley, 2005), teaching experiences (Morley, 2010), access to computer (Russell and Bradley, 1997) and ICT experiences (Cox, Preston and Cox, 1999). The aim of this research was to study whether internet usage is the silver bullet in increasing teachers' confidence with their professional use of ICT. The study analysed teachers' overall confidence in association with three facets of internet usage, which are internet access, experience, and frequency of use. Results were analysed statistically to report which internet factor could possibly influence the overall confidence.

ICT in Education

For many years, ICT has been a tool for education system. Many schools throughout the world are enthusiastically looking forward for ICT integration in hopes of providing advancing knowledge and experiences to their students and teachers. According to Somekh (2008), if ICT applications were used in the right manner, they will become powerful drivers for educational changes. ICT can also help to trigger a less-stressful workplace for both teachers and students (Somekh, 2008). Reynolds, Treharne and Tripp (2003) also listed several positive insights about ICT integration in schools. The study reported that teachers who were confident with their ICT abilities said that pupils expressed themselves more clearly when ICT were used as a medium. Not only that, some pupils were found to be more resourceful when working with ICT and even some were also observed as being able to work independently on computers (Reynolds, Treharne and Tripp, 2003).

Despite the apparent benefits of ICT uses in education, some studies highlighted the possible barriers to a successful integration of ICT in schools. Williams et al. (2000) had listed several factors which could inhibit the use of ICT in schools. They are lack of availability of ICT resources, lack of knowledge and skills, lack of support, cost of buying

and lack of time. Another interesting finding was found by Peralta and Costa (2007) who conducted a study involving primary school teachers in five European countries. They identified some issues as the sources of difficulties for teachers to use ICT, which were time constraint and unfamiliarity with new equipments. Even more recently, Bingimlas (2009) discussed some obstacles to the use of ICT in schools, where issues highlighted were on the lack of confidence, lack of competence and lack of resources on ICT. Other factors inhibiting a successful integration of ICT in schools were mismatch between ICT and existing curricula (Albirini, 2006), and teachers' commitment (Hennessy, Ruthven and Brindley, 2005).

ICT in the Malaysian Schools

Since the past decades, the Malaysian government has launched several initiatives in order to enhance the education system through the implementation and integration of ICT. Belawati (2004) reported that the MOE views ICT as a tool to revolutionise learning toward creating more effective organisational structures in schools. As an effort, the Malaysian government has introduced some ICT trainings for teachers to undergo, where 30% of teachers in Malaysia had received some form of ICT training from 1996 to 2000 (Belawati, 2004).

Keong, Horani and Daniel (2005) discussed the use of ICT for mathematics teaching in Malaysia. The preliminary observation found that the use of technology was under-utilised by the teachers (Keong, Horani and Daniel, 2005). The study identified six major barriers in adopting ICT for teaching, which were lack of time, insufficient training, inadequate technical support, lack of knowledge, difficulty in using different tools and unavailability of resources. Yunus (2007) discussed the use of ICT for teaching and learning language in Malaysian schools. The study presented an intriguing result, where ICT was found to be less applied in teaching English as a Second Language (ESL), and even worse, there were some negative views which stated that using ICT for teaching material is a waste of time. Furthermore, Yunus (2007) reported some factors that deterred teachers from using ICT in ESL, which were lack of internet access and time to gain computer skills. In contrary, Mohammad Zaini, Hanafi and Rozhan (2004) provided a positive insight about the impact of ICT on Malaysian smart schools. Their findings indicated that ICT helped to

enrich ICT culture among students, teachers, and management. The use of ICT also had enabled the schools to gain better accessibility to information and a higher utilisation of school resources (Mohammad Zaini, Hanafi and Rozhan, 2004). However, they also revealed some challenges that were encountered by the schools, which included time constraints, higher administrative cost, negative feedbacks from untrained staffs, and abuse of ICT facilities.

Teachers' Confidence in ICT

Many researches were conducted to affirm the relationship between teachers' confidence and a successful integration of ICT in schools. For example, Jamieson-Proctor et al. (2006) found that teachers' confidence was related to student frequency of ICT use in most of curriculum areas. Furthermore, the major finding was, most respondents strongly agreed that teachers' confidence is a major factor which determines teachers' and students' engagement with ICT. From an observation of teachers in technology-rich primary schools by Beauchamp (2004), it had been suggested that when teachers' confidence increases, not only students will use the technology more, but they also will become confident users of technology as well. Another study conducted by Selwood and Pilkington (2005) revealed that most teachers were confident about their ICT ability to be used for supporting teaching and learning process. Interestingly, an increase in teachers' confidence to use ICT was reported to be one of the changes contributing to more productive teachers (Selwood and Pilkington, 2005).

Thus, it is crucial for researchers to identify which factors that could be effective in increasing teachers' confidence to use ICT professionally. For example, Peralta and Costa (2007) reported several factors that might be influencing teachers' confidence in using ICT. They were ICT training, computer experience, and technical competence. Bingimlas (2009) reported that lack of confidence was one of the major barriers for technology integration in schools. For the case of Malaysia, Ab. Rahim and Shamsiah (2008) conducted a study to access the confidence level of using ICT among the trainee teachers. The study reported an interesting finding where the teachers were quite confident to integrate ICT with teaching. There was also a significant positive relationship between the

teaching experiences and age and the level of confidence. These studies showed that teachers' confidence could act as a key role in a successful implementation of ICT in schools.

Method

Sample

Participants of this study were 84 teachers in various schools in Penang, Malaysia. To specifically study the impact of internet on IT teaching, the teachers were purposely selected such that they have experiences in conducting classes on IT. This convenient sampling contained a group of teachers with various backgrounds of age, gender, ethnicity and marital status. From the collected general information, it can be seen that every respondents owned a computer, used their computer at both home and school, and had necessary computer access to other hardware. In general, all of the teachers could reasonably be expected to have at least some practical knowledge of ICT.

Instrument

The quantitative questionnaires used to collect the data had nine sections and utilised the closed-ended type of questions. The first section, containing four questions, elicited relevant demographic data. The seventh section, which was the main focus of this study, presented ten scenarios in order to identify level of confidence of each teacher on a particular ICT application. This section measured level of confidence in using word processing program, spreadsheets, PowerPoint, PhotoShop, e-mail professionally, internet resourcing, portal, saving files and creating new folders, saving and accessing shared folder, and using windows explorer. The items were designed with five scales, which are 1 (confident to train others/use weekly), 2 (confident/use fortnightly), 3 (competent/use termly), 4 (have had training/use occasionally) and 5 (need training/never use).

The Study

The main research questions were:

1. Which ICT applications have demonstrated highest level of confidence from respondents?
2. What is the level of respondents' overall confidence in using ICT professionally?
3. What is the level of internet usage among respondents?
4. Is there any relationship between internet usage and respondents' overall confidence?

Data Analysis

Data collected from all questionnaires were pooled and analysed using statistical analysis software, PASW 17.0. For the purpose of research objectives, analysis focused on two aspects, which are internet skills and confidence levels. To explore the analysis on internet skills, three distinct segments were found, which are internet access, internet experiences and frequency of using internet. These three internet skills utilised ordinal measurement scales ranging from 1 to 3, where the scales indicate high (1), moderate (2) and low (3). For confidence level, it was calculated by averaging the scores of all ten items that measure the respondent's confidences in using various ICT applications. Confidence level was also measured by using a five-scale ordinal measurement, where values ranging from "Confident to train others" (1), "Confident"(2), "Competent"(3), "Have had training"(4) and "Need training(5).

Results

Confidence in Professional Uses of ICT

The questions for examining the respondents' confidence levels in using ICT were presented in Table 1. It can be observed from the results that the mean values of all items were generally between 2 and 3, which were between confident and competent levels. Thus, knowledge in ICT among these teachers appeared to be quite high in terms of confidence levels. Specifically, their highest confidence level was when using word processing program.

To determine the strength of relationship among the items within each confidence scale, Cronbach's Alpha was used. From Table 2, it can be seen that the Alpha value was more than 0.9, which indicated an excellent reliability condition (George and Mallery, 2003).

Table 1 Descriptive statistics of confidence in professional uses of ICT

Professional uses of ICT	Mean	Std. Deviation
Using word processing program	2.21	1.155
Using spreadsheets	2.71	1.275
Using PowerPoint	2.52	1.259
Using Photo Shop	3.11	1.322
Using email professionally	2.43	1.247
Using Internet for resourcing	2.39	1.025
Using portal	2.76	1.245
Saving files and creating new folders	2.23	1.201
Saving and accessing shared files and folders	2.86	1.280
Using windows explorer	2.49	1.283

Table 2 Internal consistency of confidence items

Cronbach's Alpha	Cronbach's Alpha based on standardised items	*N* of Items
.930	.932	10

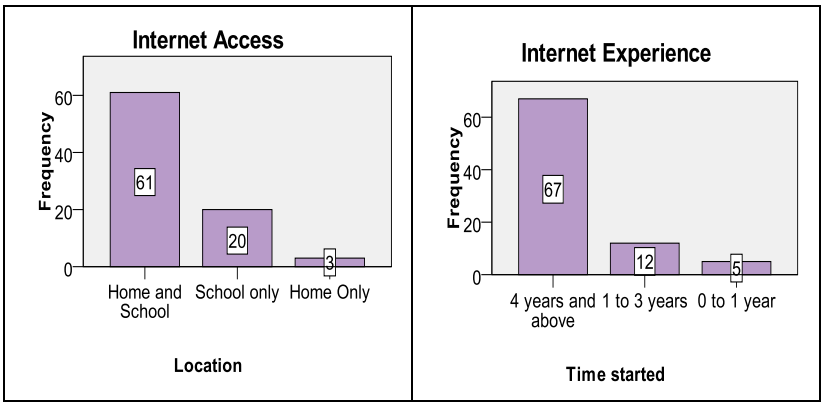
The overall confidence on teachers' professional use of ICT was obtained by averaging the scores of all ten items which pertained to the confidence levels on each application described previously. As shown in Table 3, mean value of the overall confidence was found to be 2.65, which is closed to the midpoint of the five-point scale used to measure the confidence levels. The skewness value of .146 implied that the distribution of overall confidence was approximately asymmetric.

Table 3 Descriptive statistics for overall confidence

Statistics	Value
Mean	2.65
Median	3.00
Skewness	.146

Internet Usage

Internet usage was represented by three variables which are the internet access, the internet experience and the frequency of internet usage. Summary of the statistics for each category were graphically described in Figure 1. It can be seen that most respondents had internet access at both home and school, they started online since at least four years back, and spent time at least once per day.



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Continued (**Figure 1)**

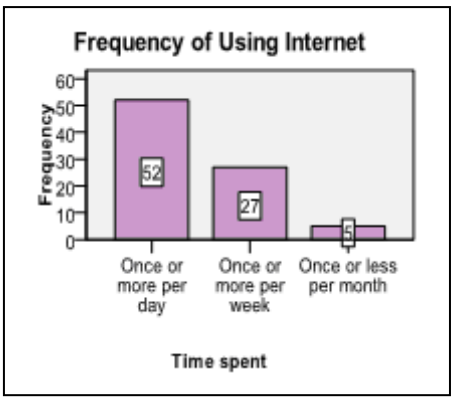

Figure 1 Summary statistics of internet usages

Crosstab Analysis

The purpose of this research is to study the influence of internet usage on respondents' perceptions toward their overall confidence in using ICT. Hence, crosstab analysis was used to discover if there is a relationship between any categories of internet usage with the overall confidence.

The first analysis was intended to study the association between internet access and overall confidence. Results were summarised in Table 4. The most intriguing finding was almost all respondents who had highest level of confidence were the ones to have internet access at both home and school, with percentage of 72.6%. The Chi-square test for this association confirmed the significant association between internet access and overall confidence ($\chi^2 = 14.656$, $p = .066$) at 0.1 level. In contrary, the Chi-square tests reported that there was no statistically significant association between internet experience and frequency of using internet with respondents' overall confidence in using ICT.

Table 4 Cross tabulation of Internet access and overall confidence

N = 84, χ^2 = 14.656, *p* = .066	**Totals**	**Internet Access**		
		Home and school	**School only**	**Home only**
Total	100%	72.6%	23.8%	3.6%
Confident to train others	15.5%	18.0%	10.0%	0%
Confident	31.0%	34.4%	20.0%	33.3%
Competent	29.8%	23.0%	50.0%	33.3%
Have had training	20.2%	21.3%	20.0%	0%
Need training	3.6%	3.3%	0%	33.3%

Discussions

The key finding in this research is that the overall confidence of respondents in using ICT professionally was at a quite high level. This may be due to the heightened emphasis on ICT training in schools by the MOE. For instance, as reported by Chan (2002), the Teacher Education Division has trained at least 55,000 teachers in the last few years. It is also a requirement that all trainee teachers at the Teacher Training Colleges need to be exposed to ICT literacy and the usage of ICT in pedagogy (Chan, 2002). These reports proved the possible reasons of why the respondents were confident about their ICT skills.

The overall analysis also has emerged a positive sight on respondents' grasps in using internet. Specifically, most respondents were reported to have internet availability at both home and school, with prior experience in using internet for more than 4 years and accessed internet for at least several times per week. This result is supported by Cuban, Kirkpatrick and Peck (2001) who reported that 82% of the teachers who were serious computer users have used computer for at least once per week at their home only (Cuban, Kirkpatrick and Peck, 2001).

Another intriguing result of this study led one to conclude that teachers who had internet access at both home and school were potentially to have higher level of confidence in using ICT. The finding was supported by Becker and his colleagues (1999) who reported that, when teachers have access to computers and internet connections, it facilitated their professional tasks and increased their propensity for assigning student

works on computers. Findings by Condie and Livingston (2007) also revealed that majority of teachers who had internet access at home and school felt that they had sufficient ICT skills needed in any online programme. Apparently, the availability of computers plays a big role to influence teachers' use of ICT. Kahveci, Sahin and Genc (2011) implied that computer ownership is an important factor for computer perceptions. Briegel et al. (2001) also suggested that computing facilities at both home and school are important for technological investment at school to result in a substantial improvement among teachers. Hence, it can be assumed that teachers who have internet at both home and school may have greater chances to be more confident with their ICT skills.

Limitations and Recommendations for Further Study

These results require further investigation on internet as one of the factors that can facilitate the use of ICT for teaching and learning. In specific, further study may travel through a more qualitative basis on how internet access can influence teachers' confidence in using ICT. Experimental studies may also be carried out to understand specifically on how does different access of internet could result in difference of confidence levels among the teachers. Other than that, teachers' internet skills may also be observed by using more in-depth analysis and tools.

Conclusions

Rapid adoption of ICT into schools often lead to questions such as: what would happen if teachers are unconfident with their competency in using ICT? Many researches have been conducted to find the answers to this question. In Malaysia for example, Ab. Rahim and Shamsiah (2008) suggested that if teachers are not confident in using ICT for teaching, it would probably hinder the effort by the MOE to integrate ICT in schools. It is clear in this sense that teachers' perceptions on their own ICT abilities play a big role in determining a successful ICT implementation in schools. Indeed, even if the teachers have the necessary ICT abilities, yet they are not confident to use the skills, the use of technology in schools might be under-utilised (Russell, Finger and Russell, 2000).

Nonetheless, research is still scarce and discrepant about which factors that can possibly result in increasing teachers' confidence with their ICT

skills. Findings from this study could lead to the conclusion that internet access is a possible key factor toward increasing teachers' confidence in their professional uses of ICT. In specific, teachers who can access internet at both home and schools are possibly the ones to demonstrate high confidence in using ICT applications. Hence, this research suggested that greater emphasis could be put on internet access so that it is ubiquitous and always available for school teachers as an effort to enhance their confidence levels in using ICT professionally.

It is difficult to predict the future trends of technology throughout the world. One thing we can be certain is that ICT adoption in schools will keep proliferating. Ultimately, teachers must be confident and comfortable with the technology first before ensuring the successful integration of ICT in schools.

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