ICT BASED LEARNING TOOLS

Seema Dahiya

Assistant Professor, Tikaram College of Education , Sonipat

ABSTRACT

In this digital era, ICT use in the classroom is important for giving students opportunities to learn and apply the required 21st century skills. Hence studying the issues and challenges related to ICT use in teaching and learning can assist teachers in overcoming the obstacles and become successful technology users. Therefore, the main purpose of this study is to analyze teachers' perceptions of the challenges faced in using ICT tools in classrooms. A quantitative research design was used to collect the data randomly from a sample of 100 secondary school teachers in the state of Melaka, Malaysia. Evidence has been collected through distribution of a modified adopted survey questionnaire. Overall, the key issues and challenges found to be significant in using ICT tools by teachers were: limited accessibility and network connection, limited technical support, lack of effective training, limited time and lack of teachers' competency. Moreover, the results from independent test show that use of ICT tools by male teachers (M =2.08, SD = .997) in the classroom is higher compared to female teachers (M = 2.04, SD = .992). It is hoped that the outcome of this research provides proper information and recommendation to those responsible for integrating new technologies into the school teaching and learning process.

1. INTRODUCTION

Information and communications technology (ICT) is an important part of most organizations these days(Zhang & Aikman, 2007). Computers began to be used in schoolsin the early 1980s, and severalscholars suggest that ICT

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will be an important part of education for the next generation (Bransford, Brown, & Cocking, 2000; Grimus, 2000; Yelland, 2001). Up to date technology offers many methods of enhancing classroom teaching and learning (Ghavifekr et al., 2014; Lefebvre, Deaudelin & Loiselle, 2006). Dawes(2001)stated that new technologies have the potential to upkeep education across the curriculum and deliver opportunities

for efficient student teacher communication in ways not possible before. ICT in education has the potentialto transform teaching. However, this potential may not easily be realized, as Dawes (2001) underlined when he stated, "problems arise when teachers are expected to implement changes in what may well be adverse circumstances" (p. 61).

Due to ICT's importance in society as well as in the future of education, identifying the possible challenges to integrating these technologies in schools would be an important step in improving the quality of teaching and learning. Balanskat, Blamire, and Kefala (2006) argue that although teachers appear to acknowledge the value of ICT in schools, they continue encountering obstacles during the processes of adopting these technologies into their teaching and learning.

Many studies have been conducted to investigate the challenges to technology integration in education (Al Alwani, 2005; Ghavifekr , Afshari & Amla , 2012; Gomes, 2005; Osborne & Hennessy, 2003; Özden, 2007). This study provides teachers' perception and perceived barriers to the use of technology tools in classroom's teaching and learning process. Therefore, the main objectives of this study are as follow:

I) To identify school teachers' perceptions in implementing ICT tools in teaching and learning in classroom.

II) To determine the challenges of using ICT tools in teaching and learning in the classroom among school teachers.

III) To identify that to what extent do teachers use ICT tools in teaching and learning in the classroom.

BACKGROUND OF STUDY

The Malaysia smartschool initiative waslaunched in 1999. The Ministry of Education Malaysia (1997) defined Malaysian Smart School or locally known as "Sekolah Bestari" as a learning institution that has been

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systematically reinvented in terms of teaching learning practices where school management prepare children for the Information Age as well as to promote the goals of the National Philosophy of Education. It is the 7th shift in the recent Malaysia Education Blueprint (2013 – 2025), which statesthe Ministry'sintention in leveraging ICT to scale up quality learning across Malaysia. It acts as a platform forthe Ministry of Education to produce a technologically literate, critically thinking work force, which is prepared to participate fully in the global economy of the 21st century (Ghavifekr & Mohammed Sani, 2015). It also acts as a spur to achieve the Malaysian's Vision 2020 to make Malaysia a leader in information and communications technology internationally. The Ministry also intends to expand 1Bestari (Wi Fi) to all schools. The Smart School project was built based on international best practices in both the primary and secondary education (MoE, 1997).

THEORETICAL FRAMEWORK

Previously, Davis, Bagozzi and Warshaw (1989) developed a theory of 'action relating to reasons' so called Technology Acceptance Model (TAM). Later based on their work, Venkatesh and Davis (2000) investigated the reasons some people use computers and their attitudes towards them that called TAM 2. The model, shown in Figure 1, links the perceived usefulness and ease of use with attitude towards using ICT and actual use (system use). They tested this model with 107 adult users, who had been using a managerial system for 14 weeks. They found that people's computer use was predicted by their intentions to use the computer and that perceived usefulness was also strongly linked to these intentions.

LITERATURE REVIEW

Challenges in using ICT in teaching and learning

Integrating ICT into teaching and learning is a complex process and one that may encounter a number of difficulties. These difficulties are known as “challenges” (Schoepp, 2005). A challenge is defined as “any condition that makes it difficult to make progress or to achieve an objective” (WordNet, 1997, as cited in Schoepp, 2005, p. 2). The following are some of the key challenges that have been identified in the

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literature regarding teachers' use of ICT tools in classroom.

i) Limited accessibility and network connection

Several research studies indicate that lack of access to resources, including home access, is another complex challenge that prevent teachers from integrating new technologies into education.

Various research studies indicated several reasons for the lack of access to technology. In Sicilia's study (2005), teachers complained about how difficult it was to always have access to computers. The author gave reasons like “computers had to be booked in advance and the teachers would forget to do so, or they could not book them for several periods in a row when they wanted to work on several projects with the students” (p. 50). In other words, a teacher would have no access to ICT materials because most of these were shared with other teachers. According to Becta (2004), the inaccessibility of ICT resources is not always merely due to the non availability of the hardware and software or other ICT materials within the school. It may be the result of one of a number of factors such as poor resource organization, poor quality hardware, inappropriate software, or lack of personal access for teachers (Becta, 2004).The challenges related to the accessibility of new technologies for teachers are widespread and differ from country to country. Empirica's (2006) European study found that lack of access is the largest barrier and that different challenges to using ICT in teaching were reported by teachers, for example a lack of computers and a lack of adequate material. Similarly, Korte and Hüsing (2007, p. 4) found that in European schools there are some infrastructure barriers such as broadband access not yet being available. They concluded that one third of European schools still lack broadband Internet access. Pelgrum (2001) explored practitioners' views from 26 countries on the main obstacles to ICT implementation in schools. He concluded that four of the top ten barriers were related to the accessibility of ICT. These barriers were insufficient unit of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient immediate Internet access. Toprakci (2006) found that low numbers of computers, oldness or slowness of ICT systems, and scarcity of educational software in the school were barriers to the successful ICT implementation in Turkish schools. Similarly, Al Alwani (2005) found

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that having no access to the Internet during the school day and lack of hardware were hampering technology integration in Saudi schools. Recent research on Syrian schools indicated that insufficient computer resources were one of the greatest impediments to technology integration in the classroom (Albirini, 2006).

ii) School with limited technical support .

Without both good technical support in the classroom and whole school resources, teachers cannot be expected to overcome the obstacles preventing them from using ICT (Lewis, 2003). Pelgrum (2001) found that in the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance. According to Gomes (2005), ICT integration in teaching needs a technician and if one is unavailable the lack of technical support can be an obstacle. In Turkey,

Toprakci (2006) found that the lack of technical support was one of two significant barriers to ICT

integration in science education in schools and might be considered "serious". In Saudi Arabia, science teachers would agree to introduce computers into teaching, except that they believe they will encounter problems such as technical service or hardware problems (Almohaissin, 2006). Sicilia (2005) argued that whatever kind of technical support and access teaching staff have and whether they have twenty years of experience or are novices to the profession, technical problems generate barriers to the smooth lesson delivery by teachers.

iii) Lack of effective training

The challenge most frequently referred to in the literature is lack of effective training (Albirini, 2006; Balanskat et al., 2006; Beggs, 2000; Özden, 2007; Schoepp, 2005; Sicilia, 2005; Toprakci, 2006; Ghavifekr & Wan Athirah, 2015). One finding of Pelgrum's (2001) study was that there were not enough training opportunities for teachers in using ICTs in a

classroom environment. Similarly, Beggs (2000) found that one of the top three barriers to teachers' useof ICT in teaching was the lack of training. Recent research in Turkey found that the main problem with implementing new ICT in education was the insufficient amount of inservice training for

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teachers (Özden, 2007), and Toprakci (2006) concluded that limited teacher training in ICT use in Turkish schools is an obstacle.

Fundamentally, when there are new tools and approaches to teaching, teacher training is essential (Osborne & Hennessy, 2003) if they are to integrate these into their teaching. However, according to Balanskat et al. (2006), inadequate or inappropriate training leads to teachers being neither sufficiently prepared nor sufficiently confident to carry out full integration of ICT in the classroom. Newhouse (2002) stated "teachers need to not only be computer literate but they also need to develop skills in integrating computer use into their teaching/learning programmes" (p. 45).

iv) Limited time

Several recent studies indicate that many teachers have competence and confidence in using computers in the classroom, but they still make little use of technologies because they lack the time. A significant number of researchers identified time limitations and the difficulty in scheduling enough computer time for classes as a barrier to teachers' use of ICT in their teaching (Al Alwani, 2005; Becta, 2004; Beggs, 2000; Schoepp, 2005; Sicilia, 2005). According to Sicilia (2005), the most common challenge reported by all the teachers was the lack of time they had to plan technology lessons, explore the different Internet sites, or look at various aspects of educational software.

v) Lack of teachers' competency

Another challenge directly related to teacher confidence is teachers' competence in integrating ICT into pedagogical practice (Becta, 2004). In Australian research, Newhouse (2002) found that many teachers lacked the knowledge and skills to use computers and were un enthusiastic about the changes and integration of supplementary learning associated with bringing computers into their teaching practices. Current research has shown that the level of this barrier differs from country to country. In the developing countries, research reported that teachers' lack of technological competence is a main barrier to their acceptance and adoption of ICT (Pelgrum, 2001; Al Oteawi, 2002). In Syria, for example, teachers' lack of technological competence has been cited as the main barrier (Albirini, 2006). Likewise, in Saudi Arabia, a lack of ICT skills is a serious obstacle to integration of technologies into science education (Al Alwani, 2005; Almohaissin, 2006).

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Empirica (2006) produced a report on ICT use in European schools. The data used for the report came from the Head Teachers and Classroom Teachers Survey carried out in 27 European countries. The findings show that teachers who do not use computers in classrooms claim that "lack of skills" are a constraining factor preventing them from using ICT for teaching. Another worldwide survey conducted by Pelgrum (2001), of nationally representative samples of schools from 26 countries, found that teachers' lack of knowledge and skills is a serious obstacle to using ICT in primary and secondary schools. The results of a study conducted by Balanskat et al. (2006) have shown that "in Denmark ... many teachers still chose not to use ICT and media in teaching situations because of their lack of ICT skills rather than for pedagogical/didactics reasons" while "in the Netherlands ... teachers' ICT knowledge and skills is not regarded any more as the main barrier to ICT use" (p. 50). Hence, lack of teacher competence may be one of the strong barriers to integration of technology into education. It may also be one of the factors involved in resistance to change.

DEMOGRAPHIC FACTORS OF THE RESPONDENTS

The following Table 1 give the demographic background of the research participants.

Table 2: Teachers' Perceptions on implementing ICT tools in teaching and learning

Items	Always	Often	Sometimes	Rarely	Never	Mean	*SD*
1 Students concentrate more on their learning	38 (38%)	27 (27%)	30 (30%)	5 (5%)	0 (0%)	2.02	.943
2 Students try harder in what they are learning	40 (40%)	29 (29%)	26 (26%)	5 (5%)	0 (0%)	1.96	.931
3 Students feel more autonomous intheir learning (they can repeat exercises if needed, explore in more detail topics that they are interested in, etc.)	39 (39%)	24 (24%)	30 (30%)	7 (7%)	0 (0%)	2.05	.989
4 Students understand more easily what they learn	26 (26%)	26 (26%)	38 (38%)	10 (10%)	0 (0%)	2.32	.973
5 Students remember more easily what they have learnt	38 (38%)	27 (27%)	30 (30%)	5 (5%)	0 (0%)	2.02	.943
6 ICT facilitates collaborative work between students	32 (32%)	41 (41%)	25 (25%)	2 (2%)	0 (0%)	1.97	.810
7 ICT improves the class climate (students more engaged, less disturbing)	32 (32%)	41 (41%)	25 (25%)	2 (2%)	0 (0%)	1.97	.810
Overall mean						**2.04**	**.914**

According to Table 2, the entire disclosures mean showed a moderate level.

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2) What are the challenges of implementing ICT tools in teaching and learning in the classroom among school teachers?

Table 3 shows the descriptive statistics about the perceptions in implementing ICT tools in teaching and learning in the classroom among schoolteachers.

Table 3: Challenges in using ICT tools in Teaching & Learning

	Items	Always	Often	Sometimes	Rarely	Never	Mean	*SD*
1	Insufficient number of computers	36 (36%)	30 (30%)	29 (29%)	5 (5%)	0 (0%)	2.03	.926
2	Insufficient number of internet-connected computers	35 (35%)	33 (33%)	26 (26%)	6 (6%)	0 (0%)	2.03	.926
3	Insufficient bandwidth or speed	33 (32.7%)	35 (34.7%)	29 (28.7%)	3 (3%)	0 (0%)	2.02	.864
4	Insufficient number of interactive whiteboards	30 (30%)	32 (32%)	21 (21%)	9 (9%)	8 (8%)	2.33	1.223
5	Insufficient number of laptops/notebooks	0 0%)	6 (6%)	9 (9%)	51 (51%)	34 (34%)	4.13	.812
6	School computers out of data and/or needing repair	9 (9%)	19 (19%)	22 (22%)	29 (29%)	21 (21%)	3.34	1.257
7	Lack of adequate skills of teachers	1 (1%)	10 (10%)	14 (14%)	43 (43%)	32 (32%)	3.95	.978
8	Insufficient technical support for teachers	30 (30%)	44 (44%)	25 (25%)	1 (1%)	0 (0%)	1.97	.771
9	Insufficient pedagogical support for teachers	25 (25%)	47 (47%)	26 (26%)	2 (2%)	0 (0%)	2.05	.770
10	Lack of adequate content/material for teaching	10 (10%)	15 (15%)	15 (15%)	31 (31%)	29 (29%)	3.54	1.321
11	Lack of content in national language	17 (17%)	31 (31%)	18 (18%)	19 (19%)	15 (15%)	2.84	1.331
12	Too difficult to integrate in ICT use into curriculum	11 (11%)	23 (23%)	16 (16%)	27 (27%)	23 (23%)	3.28	1.341
13	Lack of pedagogical models on how to use ICT for learning	0 (0%)	6 (6%)	9 (9%)	51 (51%)	34 (34%)	4.13	.812
14	School time organization (fixed lesson time, etc.)	11 (11%)	23 (23%)	16 (16%)	27 (27%)	23 (23%)	3.28	1.341
15	School space organization (classroom size and furnitureetc.)	10 (10%)	15 (15%)	15 (15%)	31 (31%)	29 (29%)	3.54	1.321
16	Pressure to prepare students for exam and tests	10 (10%)	15 (15%)	15 (15%)	31 (31%)	29 (29%)	3.54	1.321
17	Most parents not in favor of using ICT in school	5 (5%)	10 (10%)	11 (11%)	42 (42%)	32 (32%)	3.86	1.128
18	Most teachers not in favor of using ICT in school	10 (10%)	15 (15%)	15 (15%)	31 (31%)	29 (29%)	3.54	1.321
19	Lack of interest in teachers	11 (11%)	23 (23%)	16 (16%)	27 (27%)	23 (23%)	3.28	1.341
20	No or unclear benefit to use ICT for teaching	10 (10%)	15 (15%)	15 (15%)	31 (31%)	29 (29%)	3.54	1.321
21	Using ICT in teaching and learning not being a goal in our school	24 (24%)	50 (50%)	23 (23%)	2 (2%)	1 (1%)	2.06	.802
	Overall mean						**3.06**	**1.106**

According to Table 3, the entire disclosures mean showed a moderate level.

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DISCUSSION & CONCLUSION

This study is more related to identifying the perceptions in implementing ICT tools in teaching and learning in the classroom among school teachers. Furthermore, it examines the challenges of using ICT tools in teaching and learning in the classroom among school teachers and recognizes the effectivenessof the extent of ICT tools in supporting classroom teaching and learning. Based on the study the findings indicate that average level of the perceptions in implementing ICT tools in teaching and learning in the classroom among school teachers, high level of challenges of using ICT tools in teaching and learning in the classroom among school teachers and recognizing the effectiveness of the extent of ICT tools in supporting teaching and learning in the classroom.

With the advent of Information and Communications Technologies (ICT) in education, teachers form their own beliefs about the role of ICT as a teaching tool, the value of ICT for student learning outcomes and their own personal confidence and competency (Prestridge, 2007). Barriers exist in integrating ICT in teaching and learning (Ertmer, 2005). The barriers are extrinsic to the teacher and include lack of resources, time, access and technical support. Findings of this research suggest that teachers were still giving comment on the barriers in implementing ICT tools at school in teaching and learning.

Results of the Cachia and Ferrari (2010) study showed that teachers do combine different resources in their teaching, as well as utilizing various modes of ICT with almost two thirds claiming to use technologies (63%) and website (62%). Anyway, it is also evident that textbooks are still considered fundamental in the educational systems. Nearly two thirds of our respondents (64%) *always* or *often* follow textbooks in their teaching. Important technologies for learning such as computers (98%) and educational software (93%) were ranked as the top technologies by the respondents of Cachia and Ferrari's (2010) research. On the other hand, our research showed that the rate of ICT use among teachers in school is average. However, the finding shows that more teachers used computer with teaching software in the classroom to present or demonstrate examples to students. They also like to use the computer to access students' results and keep track of their progress. Despite the current efforts in ICT integration in

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schools, many families specifically in rural areas still do not know how to use ICT tools in their daily life. They even did not know how to check their children's results in the existing systems. Not all houses have computers and Internet facilities to use daily. In this regard, the main challenge is to provide appropriate ICT tools to both urban and rural areas efficiently. This study will offer priceless information to the school administration as well as to educational policy makers regarding the nature of ICT contribution to the teaching learning process. Since the attitude and perceptions of the teachers are critical to how effectively an innovation is implemented, it is important to gauge how teachers perceive this innovation and its efficacy as a tool for enhanced teaching and learning. It is also hoped that this study will contribute to the growing knowledge base and 21st century generation regarding the use of ICT in education in Malaysia.

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