Teaching and Learning with ICT Tools: Issues and Challenges from Teachers' Perceptions

Simin Ghavifekr[1], Thanusha Kunjappan[2] , Logeswary Ramasamy [3], Annreetha Anthony [4]

[1] drsimin@um.edu.my
Faculty of Education, University of Malay, Malaysia

[2] Faculty of Education, University of Malay, Malaysia

[3] Faculty of Education, University of Malay, Malaysia

[4] Faculty of Education, University of Malay, Malaysia

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 t-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.

Keywords:　*ICT Tools, Teaching & Learning, Technology Issues & Challenges, Education, Malaysia*

INTRODUCTION

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

However, despite the Ministry of Education, Malaysia having embarked on the project "1Bestarinet" in providing a virtual learning platform in schools to enhance ICT usage among teachers, ICT has not been fully adopted in the teaching and learning process in most schools in the country. Only a few teachers are using ICT as teaching and learning tools (MoCT, 2003). This is because the challenges outweigh the benefits (Bingimlas, 2009). Therefore, this study is expected to generate information on the teachers' perceptions and challenges of integrating ICT tools in the teaching and learning process. With changes in modern technologies learners need to be equipped with updated knowledge that will help them adapt to the changing world. Such knowledge leads to better communication and increased 21st century skills as a result of e-Commerce and self-employment in the ICT sector.

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.

However, in this paper ICT tools refers to the common technology-based tools that are using in schools such as computer, Laptop , LCD, digital photocopy machine, digital Audio and Video devices, digital camera, scanner, DVD player and multimedia projector.

Background of Study

The Malaysia smart school initiative was launched 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 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 states the Ministry's intention in leveraging ICT to scale up quality learning across Malaysia. It acts as a platform for the 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).

Besides that, the Malaysian Ministry of Education is encouraging other schools to equip themselves with appropriate levels of technology according to their means and capacities. Schools are encouraged on their own initiative to seek assistance from various stakeholders, parents, community and private sector organizations as the MoE can only provide technology to schools in stages (Ghavifekr, 2012; Khalid Abdullah, 2009). Under the Smart School project, about 8,000 schools will be equipped with computer facilities by the end of 2005. By 2010, it is projected that about 10,000 primary and secondary schools will have computer facilities. More schools will obtain computers with Internet connection and teachers will be encouraged to use them in their classroom teaching (MoE, 1997). In 2004, Malaysia had more than 4000 schools with computer laboratories and two years later about 9,200 schools had been equipped with broadband Internet access (MoE, 2006).

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.
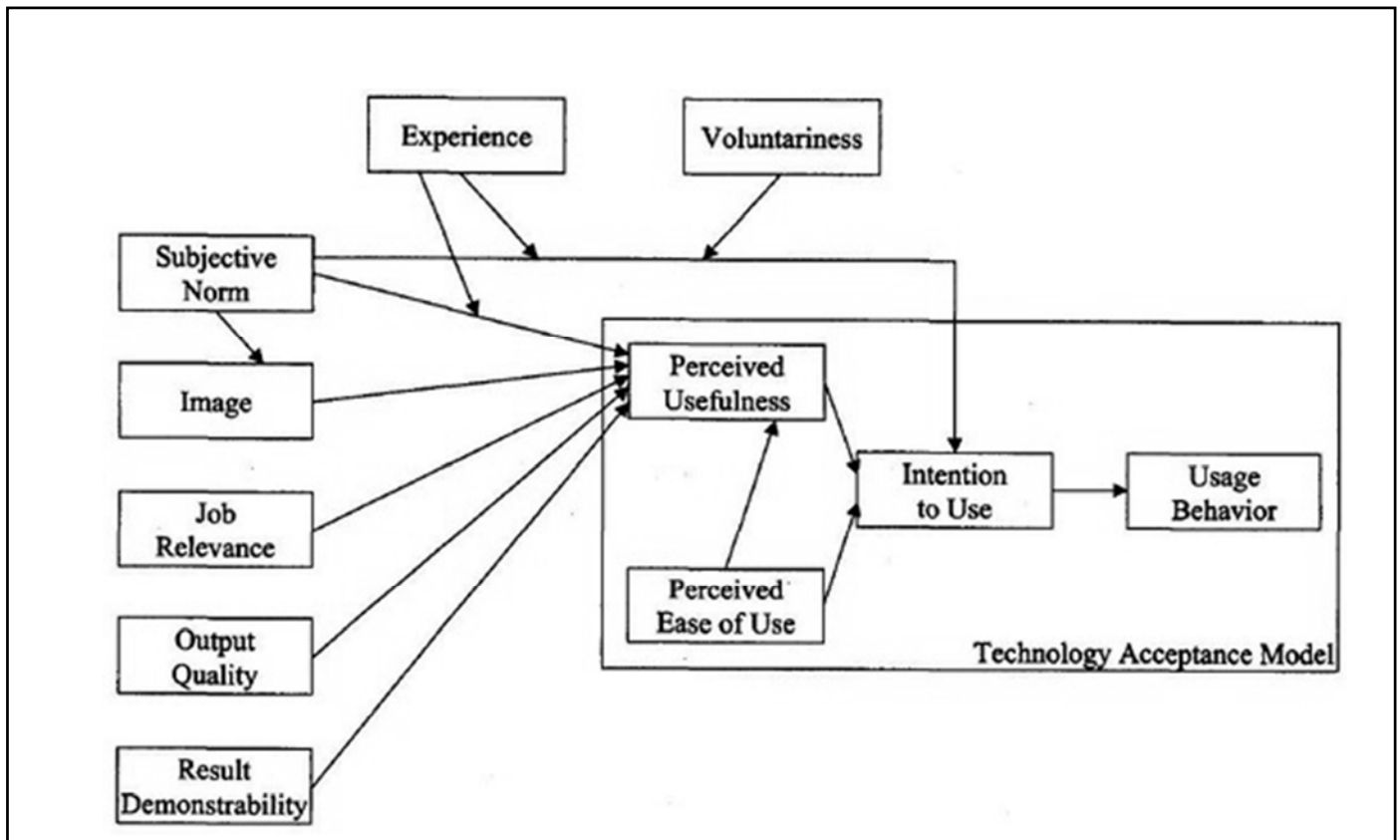

Figure 1. A theoretical extension of the technology acceptance model as TAM 2 (Source: Venkatesh & Davis, 2000)

According to Venkatesh and Davis (2000) when teachers are presented with a new technology, two key factors would influence their decision from the extended variables around them about how and when they will use it:

- **External Variables** – It represents the challenges that teachers face that come from outside their sphere of control when integrating a new technology in their teaching and learning process. These challenges include:

    - Limited accessibility and network connection

    - Schools with limited ICT facilities

    - Lack of effective training

    - Limited time

    - Lack of teachers' competency

- **Perceived usefulness (PU)** – It represents the degree to which they believe that using a particular technology would enhance their job performance. If teachers feel there is no need to question or

change their professional practice then, according to studies, they are unlikely to adopt the use of ICT tools. However, if they perceive ICT to be useful to them, their teaching and their pupils' learning, then according to the empirical evidence of previous studies (Cox, Preston & Cox, 1999) they are more likely to have a positive attitude to using ICT in the classroom. The following factors have been identified as key elements to teachers' perceived usefulness of ICT tools:

o   Work more quickly

o   Job performance

o   Increased productivity

o   Effectiveness

o   Useful

- **Perceived ease-of-use (PEOU)** – It represents the degree to which they believe that using a particular system would be free from effort. Previous studies have identified a number of factors relating to the perceived ease of use of ICT, in study on experienced practicing ICT users. The Impact project (Watson, 1993) and other studies identified a wide range of skills and competencies which teachers felt they needed in order to find ICT easy to use. Some of these are:

    o   Easy to learn

    o   Clear and understandable

    o   Easy to use

    o   Controllable

    o   Easy to remember

- **Attitude toward use** – teacher's positive or negative feeling about performing the target behavior (e.g., using a system). Basically, teachers' attitudes too many of these factors will depend upon how easy they perceive using ICT tools to be on a personal level as well as for teaching in the classroom.

- **Behavioral intention** - The degree to which the teacher has formulated conscious plans to perform or not perform some specified future behavior.

- **Social influence processes** (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) as determinants of perceived usefulness and usage intentions.

Basically, the updated version of TAM 2 consists of additional determinants that are social influence process and cognitive instrumental processes of perceived usefulness and usage 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 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 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.

In Sicilia's study (2005), technical problems were found to be a major barrier for teachers. These technical barriers included waiting for websites to open, failing to connect to the Internet, printers not printing, malfunctioning computers, and teachers having to work on old computers. "Technical barriers impeded the smooth delivery of the lesson or the natural flow of the classroom activity" (Sicilia, 2005, p. 43).

Korte and Hüsing (2007) argued that ICT support or maintenance contracts in schools help teachers to use ICT in teaching without losing time fixing software and hardware problems. The Becta (2004) report stated "if there is a lack of technical support available in a school, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns" (p. 16). Many of the respondents to Becta's survey (2004) indicated that technical faults might discourage them from using ICT in their teaching because of the fear of equipment breaking down during a lesson. In teaching, several studies indicated that lack of technical support is a main barrier to using technologies. 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' use of 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 in-service training for teachers (Özden, 2007), and Toprakci (2006) concluded that limited teacher training in ICT use in Turkish schools is an obstacle.

According to Becta (2004), the issue of training is certainly complex because it is important to consider several components to ensure training effectiveness. These were time for training, pedagogical training, skills training, and an ICT use in initial teacher training. Correspondingly, recent research by Gomes (2005) relating to various subjects concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom and lack of training concerning technology use in specific subject areas were obstacles to using new technologies in classroom practice. Some of the Saudi Arabian studies reported similar reasons for failures in using educational technology: the weakness of teacher training in the use of computers, the use of a "delivery" teaching style instead of investment in modern technology (Alhamd, Alotaibi, Motwaly, & Zyadah, 2004), as well as the shortage of teachers qualified to use the technology confidently (Sager, 2001).

Providing pedagogical training for teachers, rather than simply training them to use ICT tools, is an important issue (Becta, 2004). Cox et al. (1999a) argue that if teachers are to be convinced of the value of using ICT in their teaching, their training should focus on the pedagogical issues. The results of the research by Cox et al. (1999a) showed that after teachers had attended professional development courses in ICT they still did not know how to use ICT in their classrooms; instead they just knew how to run a computer and set up a printer. They explained that this is because the courses only focused on teachers acquiring basic ICT skills and did not often teach teachers how to develop the pedagogical aspects of ICT. In line with the research by Cox et al. (1999a), Balanskat et al. (2006) indicated that inappropriate teacher training is not helping teachers to use ICT in their classrooms and in preparing lessons. They assert that this is because training programs do not focus on teachers' pedagogical practices in relation to ICT but on developing ICT skills.

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.

Becta's study (2004) found that the problem of lack of time exists for teachers in many aspects of their work as it affects their ability to complete tasks, with some of the participant teachers specifically stating which aspects of ICT require more time. These include the time needed to locate Internet advice, prepare lessons, explore and practise using the technology, deal with technical problems, and receive adequate training.

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). 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.

METHODOLOGY

Research Design

In this research, quantitative methodology was used to collect and analyze the data obtained from all the respondents. A questionnaire was self-developed and finalized by the researchers before being distributed to the targeted group of respondents. The questionnaire was designed specifically to address research objectives with regard to teachers' perception on use of ICT tools in public secondary schools in Melaka.

Instrumentation & Sampling

A self-developed cross-sectional survey questionnaire consisting of 7 sections and 114 items was tested among respondents. The questionnaire was based on 5-point Likert Scale ranging from: 5 = always, 4 = often, 3 = sometimes, 2 = rarely and 1 = never. A total of 100 secondary school teachers in the state of Melaka were selected randomly as the sample for the study. The sample responded to the statements given and chose their answers based on their perceptions. The survey was distributed by hand to the respondents. The various sections of the questionnaire included: (A) Personal Details, (B) Experience with ICT for Teaching, (C) ICT access for teaching, (D) Support for teachers for ICT use, (E) Challenges of using ICT tools in teaching and learning, (F) Teachers' ICT skills, (G) Teachers' opinion about ICT use impact on students' learning outcome.

Data Collection Procedures

Data collection defines the procedure for collecting data by the researcher. The questionnaire has been distributed to 120 teachers randomly. They were given one week to fill in the questionnaire and return it to the researcher. All of the participants volunteered themselves in the research. Some questionnaires were with missing information that the details could not be used as a contribution in this research. Finally 100 questionnaires were returned to the researchers for data analysis.

Data Analysis Process

The data collected from the respondents were gathered together to be analyzed using the Statistical Packages for the Social Sciences (SPSS) version 22. The analysis includes both descriptive and inferential analysis. The researchers used descriptive analysis to analyze the frequency and percentage of the overall population in the demographic background. Besides, it is also used to determine the mean, standard deviation, frequency and percentage. Inferential statistics (*t*-test) were also used to analyze the research findings.

Validity & Reliability

Internal consistency is measured in this research using the Cronbach's coefficient alpha (α). This method is used to identify the correlation between scores of each item in the test and the total score for all items in the test or is known as test index score. Items with high correlation with the test index score have high reliability, and those with low correlation values with the test index score have low reliability and will be deleted from the test. Based on the findings, the Cronbach's alpha value for this study shows .817 which is satisfactory (between .65 − .95). The alpha value shows that the instrument is reliable. In fact, all items in the instrument have α level of more than .7. The highest alpha level is .847 and the lowest is .799.

FINDINGS

Demographic Factors of the Respondents

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

Table 1 shows the demographic finding where the age category under 25 is frequency 4 and percentage is 4%, age 26-35 is frequency 64 and percentage is 64%, age 36-45 is frequency 27 and percentage is 27%, age 46-55 is frequency 3 and percentage is 3%, and age 55+ is frequency 2 and percentage is 2%.

The gender finding shows male as frequency 25 and percentage is 25% and female is frequency 75 and percentage is 75%. The experience based on the years of experience by the sample is less than 1 year frequency is 5 and the percentage is 5%, 1-4 years frequency is 25 and the percentage is 25%, 5-10 years frequency is 16 and the percentage is 16%, 1 0-20years frequency is 16 and the percentage is 16%, and 20+ years frequency is 1 and the percentage is 1%.

Ethnicity analysis shows that Malay frequency is 37 (37%), Chinese frequency is 19 and the percentage is 19%, Indian frequency is 44 and the percentage is 44% and Others frequency is 0. The subjects taught by the respondents are: Language (frequency is 38 and percentage is 38%), Mathematics (f = 36 or 36%), Science subjects (f = 22 or 22%) and Other (f = 4 or percentage 4%). Based on the data obtained, most of the participants in this research are aged between 36-45 years, the majority are female and have 5-10 years of experience.

Table 1: Demographic finding on sample

Factors	Category	Frequency	Percentage %
Age	Under 25	4	4%
	26-35	64	64%
	36-45	27	27%
	46-55	3	3%
	55+	2	2%
Gender	Male	25	25%
	Female	75	75%
Experience	Less than 1 year	5	5%
	1-4 years	25	25%
	5-10 years	53	53%
	10-20 years	16	16%
	20 years +	1	1%
Ethnicity	Malay	37	37%
	Chinese	19	19%
	Indian	44	44%
	Others	0	0%
Subject Taught	Language	38	38%
	Mathematic	36	36%
	Sciences	22	22%
	Others	4	4%

Research Questions

1) **What are the perceptions in implementing ICT tools in teaching and learning in the classroom among school teachers?**

The following Table 2 shows the descriptive statistics about the perceptions in implementing ICT tools in teaching and learning in the classroom among school teachers.

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 in their 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. For the statement "Students concentrate more on their learning" (M = 2.02, SD = .943), 38% respondents always, 27% often, 30% sometimes, 5% rarely and 0% never. For the statement of "Students try harder in what they are learning" (M = 1.96, SD = 0.931), 40% respondent always, 29% often, 26% sometimes, 5% rarely and 0% never. "Students feel more autonomous in their learning (they can repeat exercises if needed, explore in more detail topics that they are interested in, etc.)" (M = 2.05, SD = 0.989), 39% respondent always, 24% often, 30% sometimes, 7% rarely and 0% never. "Students understand more easily what they learn" (M = 2.32, SD = 0.973), 26% respondent always, 26% often, 38% sometimes, 10% rarely and 0% never. "Students understand more easily what they learn Students remember more easily what they've learnt" (M = 2.02, SD = 0.943), 38% respondent always, 27% often, 30% sometimes, 5% rarely and 0% never. "ICT facilitates collaborative work between students" (M = 1.97, SD = 0.810), 32% respondent always, 41% often, 25% sometimes, 2% rarely and 0% never. Finally, "ICT improves the class climate (students more engage, less disturbing)" (M = 1.97, SD = 0.810), 32% respondent always, 41% often, 25% sometimes, 2% rarely and 0% never. The mean level of expression statement was in between 1.96 to 2.32. While overall mean constraints is M = 2.04, SD = .914 which is at a moderate level.

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 furniture etc.)	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. For the statement "Insufficient number of computers" (M=2.03, SD=.926), 38% respondent always, 27% often, 30% sometimes, 5% rarely and 0% never. For the statement of "Insufficient number of internet-connected computers" (M=2.03, SD=0.926), 35% respondent always, 33% often, 26% sometimes, 6% rarely and 0% never. "Insufficient bandwidth or speed" (M=2.02, SD=0.864), 33% respondent always, 35% often, 29% sometimes, 3% rarely and 0% never. "Insufficient number of interactive whiteboards" (M=2.02, SD=0.864), 30 respondent always, 32% often, 21% sometimes, 9% rarely and 8% never. "Insufficient number of laptops/notebooks" (M=4.13, SD=0.812), 0% respondent always, 6% often, 9% sometimes, 51% rarely and 34% never. "School computers out of data and/or needing repair" (M=3.34, SD=1.257), 9% respondent always, 19% often, 22% sometimes, 29% rarely and 21% never. "Lack of adequate skills of teachers" (M=3.95, SD=0.978), 1% respondent always, 10% often, 14% sometimes, 43% rarely and 32% never. "Insufficient technical support for teachers" (M=1.97, SD=0.771), 30% respondent always, 44% often, 25% sometimes, 1% rarely and 0% never. "Insufficient pedagogical support for teachers" (M=2.05, SD=0.770), 25 respondent always, 47% often, 26% sometimes, 2% rarely and 0% never. "Lack of adequate content/material for teaching" (M=3.54, SD=1.321), 10% respondent always, 15% often, 15% sometimes, 31% rarely and 29% never. "Lack of content in national language" (M=2.84, SD=1.331), 17% respondent always, 31% often, 18% sometimes, 19% rarely and 15% never. "Too difficult to integrate in ICT use into curriculum" (M=3.28, SD=1.341), 11% respondent always, 23% often, 16% sometimes, 27% rarely and 23% never. "Lack of pedagogical models on how to use ICT for learning" (M=4.13, SD=0.812), 0% respondent always, 6% often, 9% sometimes, 51% rarely and 34% never. "School time organization (fixed lesson time, etc)" (M=3.28, SD=1.341), 30 respondent always, 32% often, 21% sometimes, 9% rarely and 8% never.

"Insufficient number of laptops/notebooks" (M=4.13, SD=0.812), 11% respondent always, 23% often, 16% sometimes, 27% rarely and 23% never. "School space organization (classroom size and furniture, etc)" (M=3.54, SD=1.321), 10% respondent always, 15% often, 15% sometimes, 31% rarely and 29% never. "Pressure to prepare students for exam and tests" (M=3.54, SD=1.321), 10% respondent always, 15% often, 15% sometimes, 31% rarely and 29% never. "Most parents not in favor of using ICT in school" (M=3.86, SD=1.128), 5% respondent always, 10% often, 11% sometimes, 42% rarely and 32% never. "Most teachers not in favor of using ICT in school" (M=3.54, SD=1.321), 10% respondent always, 15% often, 15% sometimes, 31% rarely and 29% never. "Lack of interest in teachers" (M=3.28, SD=1.341), 11% respondent always, 23% often, 16% sometimes, 27% rarely and 23% never. "No or unclear benefit to use ICT for teaching" (M=3.54, SD=1.321), 10% respondent always, 15% often, 15% sometimes, 31% rarely and 29% never. Finally, "Using ICT in teaching and learning not being a goal in our school" (M=2.06, SD=0.802), 24% respondent always, 50% often, 23% sometimes, 2% rarely and 1% never.

The mean level of expression statement was in between 1.97 to 4.13. While overall mean constraints is M = 3.06, SD = 1.106 which is at a high level.

3) To what extent do teachers use ICT tools in teaching and learning in the classroom?

Table 4 shows the descriptive statistics about the extent do teachers use ICT tools in teaching and learning in the classroom.

According to Table 4, the entire disclosures mean showed a moderate level. For the statement "Produces a text using a word processing program" (M = 2.05, SD = .989), 39% respondent always, 24% often, 30% sometimes, 7% rarely and 0% never. For the statement of "Use emails to communicate with other" (M = 2.32, SD = .973), 26% respondent always, 26% often, 38% sometimes, 10% rarely and 0% never. "Capture and edit digital photos, movies or other graphics" (M = 2.05, SD = .989), 39% respondent always, 24% often, 30% sometimes, 7% rarely and 0% never. "Edit text online containing internet links and images" (M = 2.32, SD = .973), 26 respondent always, 26% often, 38% sometimes, 10% rarely and 8% never. "Create a database" (M = 2.02, SD = 0.943), 38% respondent always, 27% often, 30% sometimes, 5% rarely and 0% never. "Edit a questionnaire online" (M = 1.97, SD = 0.810), 32% respondent always, 41% often, 25% sometimes, 2% rarely and 0% never. "Email a file to someone, another student or teacher" (M = 1.97, SD = .810), 32% respondent always, 41% often, 25% sometimes, 2% rarely and 0% never. "Organize computer files in folders and subfolders" (M = 2.38, SD = .801), 15% respondent always, 37% often, 43% sometimes, 5% rarely and 0% never. "Use a spread sheet" (M = 2.32, SD = 0.777), 14 respondent always, 45% often, 36% sometimes, 5%

rarely and 0% never.

Table 4: Use of ICT tools in classroom

	Items	Always	Often	Sometimes	Rarely	Never	Mean	S.D
1	Produces a text using a word processing program	39 (39%)	24 (24%)	30 (30%)	7 (7%)	0 (0%)	2.05	.989
2	Use emails to communicate with other	26 (26%)	26 (26%)	38 (38%)	10 (10%)	0 (0%)	2.32	0.973
3	Capture and edit digital photos, movies or other graphics	39 (39%)	24 (24%)	30 (30%)	7 (7%)	0 (0%)	2.05	.989
4	Edit text online containing internet links and images	26 (26%)	26 (26%)	38 (38%)	10 (10%)	0 (0%)	2.32	0.973
5	Create a database	38 (38%)	27 (27%)	30 (30%)	5 (5%)	0 (0%)	2.02	.943
6	Edit a questionnaire online	32 (32%)	41 (41%)	25 (25%)	2 (2%)	0 (0%)	1.97	0.810
7	Email a file to someone, another student or teacher	32 (32%)	41 (41%)	25 (25%)	2 (2%)	0 (0%)	1.97	.810
8	Organize computer files in folders and subfolders	15 (15%)	37 (37%)	43 (43%)	5 (5%)	0 (0%)	2.38	.801
9	Use a spread sheet	14 (14%)	45 (45%)	36 (36%)	5 (5%)	0 (0%)	2.32	.777
10	Use a spread sheet to plot a graph	20 (20%)	37 (37%)	37 (37%)	5 (5%)	1 (1%)	2.30	.882
11	Create a presentation with simple animation functions	30 (30%)	40 (40%)	28 (28%)	2 (2%)	0 (0%)	2.02	.816
12	Create a presentation with video or audio clips	36 (36%)	34 (34%)	29 (29%)	0 (0%)	1 (1%)	1.96	.864
13	Participate in a discussion forum on the internet	32 (32%)	41 (41%)	25 (25%)	2 (2%)	0 (0%)	1.97	.810
14	Create and maintain blogs or web sites	30 (30%)	40 (40%)	28 (28%)	2 (2%)	0 (0%)	2.02	.816
15	Participate in social networks	14 (14%)	45 (45%)	36 (36%)	5 (5%)	0 (0%)	2.32	.777
16	Download and install software in computer	30 (30%)	40 (40%)	28 (28%)	2 (2%)	0 (0%)	2.02	.816

						0 (0%)		
17	Download or upload curriculum resources from/to website or learning platforms for students to use	14 (14%)	45 (45%)	36 (36%)	5 (5%)		2.32	.777
18	Teach students how to behave safely online	32 (32%)	41 (41%)	25 (25%)	2 (2%)	0 (0%)	1.97	.810
19	Teach students how to behave ethically online	14 (14%)	45 (45%)	36 (36%)	5 (5%)	0 (0%)	2.32	.777
20	Prepare materials to use with an interactive whiteboard	0 (0%)	1 (1%)	3 (3%)	20 (20%)	76 (76%)	4.71	.574
	Overall mean						2.27	.839

For the item "Use a spread sheet to plot a graph" (M = 2.30, SD = .882), 20% respondents always, 37% often, 37% sometimes, 5% rarely and 1% never. "Create a presentation with simple animation functions" (M=2.02, SD= .816), 30% respondent always, 40% often, 28% sometimes, 2% rarely and 0% never. "Create a presentation with video or audio clips" (M=1.96, SD= .864), 36% respondent always, 34% often, 29% sometimes, 0% rarely and 1% never. "Participate in a discussion forum on the internet" (M=1.97, SD=0.810), 32% respondent always, 41% often, 25% sometimes, 2% rarely and 0% never. "Create and maintain blogs or web sites" (M=2.02, SD= .816), 30 respondent always, 40% often, 28% sometimes, 2% rarely and 0% never. "Participate in social networks" (M=2.32, SD=0.777), 14% respondent always, 45% often, 36% sometimes, 5% rarely and 0% never. "Download and install software in computer" (M=2.02, SD= .816), 30% respondent always, 40% often, 28% sometimes, 2% rarely and 0% never. "Download or upload curriculum resources from/to website or learning platforms for students to use" (M=2.32, SD= .777), 14% respondent always, 45% often, 36% sometimes, 5% rarely and 0% never. "Teach students how to behave safely online" (M=1.97, SD= .810), 32% respondent always, 41% often, 25% sometimes, 2% rarely and 0% never. "Teach students how to behave ethically online" (M=3.32, SD= .777), 14% respondent always, 45% often, 36% sometimes, 5% rarely and 0% never. "Prepare materials to use with an interactive whiteboard" (M=4.71, SD= .547), 0% respondent always, 1% often, 3% sometimes, 20% rarely and 76% never. The mean level of expression statement was in between 1.96 to 4.71. While overall mean constraints is M = 2.27, SD = .839 which is at a moderate level.

Hypothesis Testing

Ho_1 : There is no relationship between gender and the use of ICT tools to support teaching and learning in the classroom.

H_1 : There is a significant relationship between gender and the use of ICT tools to support teaching and learning in the classroom.

Table 5: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	*t*	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
G3	Equal variances assumed	.055	.815	.174	98	.862	.040	.229	-.415	.495
	Equal variances not assumed			.174	41.031	.863	.040	.230	-.424	.504

Table 6: Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
G3	Male	25	2.08	.997	.199
	Female	75	2.04	.992	.115

From the independent *t*-test means in Table 5, the results show that the use of ICT tools in teaching and learning in the classroom of the male (*M* =2.08, *SD* = .997) is higher than the use of ICT tools in teaching and learning in the classroom learning of the female (*M* = 2.04, *SD* = .992) was insignificant, *t* = .174, d.f. = 98, *p* = .0005, however, since the *p* < .05 so the null hypothesis is rejected and alternate hypothesis is accepted, and the means of the two groups are significantly different from each other. Thus, the data provide sufficient evidence to conclude that the uses of ICT in teaching and learning in the classroom by males are higher than among the females.

Ho$_2$: There is no relationship between the teachers years of teaching experience and the use of ICT tools to support teaching and learning in the classroom.

H$_2$: There is significant relationship between the teachers years of teaching experience and the use of ICT tools to support teaching and learning in the classroom.

Table 7: Independent Samples Test

		Levene's Test for Equality of Variances		*t*-test for Equality of Means						
		F	Sig.	*t*	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
B1	Equal variances assumed	.526	.474	.339	28	.737	.120	.354	-.606	.846

Equal variances not assumed	.345	5.820	.742	.120	.348	-.738	.978

Table 8: Group Statistics

	Experience	N	Mean	Std. Deviation	Std. Error Mean
B1	Less than 1 year	5	2.00	.707	.316
	1-4 years	25	1.88	.726	.145

From the independent *t*-test in Table 7, the results show that the use of ICT tools in teaching and learning in the classroom of the less than 1 year (*M* =2.00, *SD* = .707) is higher than the use of ICT tools in teaching and learning in the classroom learning of the 1-4 years (*M* = 1.88, *SD* = .726) was insignificant, t = .339, d.f. = 28, *p* = .0005, however, since the $p < .05$ the null hypothesis is rejected and alternate hypothesis is accepted, and the means of the two groups are significantly different from each other. Thus, the data provide sufficient evidence to conclude that the uses of ICT of less than 1 year are adequate in use of ICT tools in teaching and learning in the classroom than the 1-4 years' experience; therefore there is a relationship between use of ICT tools and years of experience.

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 effectiveness of 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 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.

In future studies more focus should be given on management strategies and policies to address the barriers faced by teachers in using ICT tools in teaching and learning. If the barriers faced by teachers can be overcome, it is a step forward to enhance our students' learning outcome. The studies done with the same gender distribution could give more appropriate analysis whereby the gender perceptions could be analyzed.

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