TEACHER READINESS ON ICT INTEGRATION IN TEACHING-LEARNING: A MALAYSIAN CASE STUDY

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ABSTRACT

The purpose of this study is to investigate the knowledge level, attitude towards the use of ICT in teaching-learning and obstacles faced by the in-service teachers in secondary schools. A survey was conducted involving all 50 teachers in a secondary school in the state of Penang. The study informed the researchers that teachers were comfortable with the use of certain applications such as spreadsheet, presentation software, internet and e-mail. The respondents demonstrated a positive attitude towards using ICT as majority of them used ICT for teaching and learning and felt that the connected classrooms can change the way students learn in classrooms. The study also proved that a connected classroom can be effective for students' learning to happen. It was also found that the attitudes of teachers on use of ICT vary with their years of experience and level of knowledge on ICT.

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Keywords: In-service teachers, ICT, Teaching-learning process, Students' attitude towards ICT use in classrooms, Teachers' ICT knowledge, Classroom learning.

Contribution/ Originality

This study is one of very few studies which have investigated secondary teachers' knowledge and attitude towards ICT use in classrooms. The paper's primary contribution is finding that teachers' attitudes on ICT use in classrooms vary with their years of experience and level of ICT knowledge.

1. INTRODUCTION

The use of information and communication technology (ICT) brings about a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self directed and constructive way (Volman and Eck, 2001). ICT is not only considered as a tool, which can be added for existing teaching methods but also nowadays ICT is seen as an important instrument to support new ways of teaching-learning process. Information and communication technology (ICT) is being integrated into the teaching-learning process in various educational institutions in the world. Successful integration of ICT in teaching-learning process is highly dependent on the preparation of teachers. The use of ICT in the classroom is very important to provide opportunities for students to learn and operate in the information age.

To meet the demands of the 21st century, people need to know more than core subjects. They need to know how to use their knowledge and skills by thinking critically, applying knowledge to new situations, analyzing information, generating new ideas, communicating, collaborating, solving problems and making decisions. These skills provide both flexibility and security in an era of constant change. People who can learn new information, new software programs or a new ways of doing things have much better prospects in the world than people who cannot. It is evident today that Malaysian students lack the ability to think critically and analytically, and to make decisions on their own The ability of students in critical thinking and analytical was rated below satisfactory or fair (Partnership for 21st Century Skills, 2002).

The Ministry of Education launched a comprehensive review of the education system in Malaysia in October 2011. A new National Education Blueprint was developed to raise the education standards and it is the Government's aspiration of ensuring students are equipped with the 21st century skills. To this end, the Malaysia Government has developed the Education Blueprint 2013-2025. It provides a comprehensive plan for a rapid and sustainable transformation of our education system through to 2025. And by building on the range of initiatives introduced as National Key Result Areas, it sets out the fundamental changes that are required. From how to approach student learning, the way to recruit, train and reward the teachers and principals right through to how the Ministry of Education itself operates, it lays out a process for that change. And in doing so, it lays out clear improvements on the factors that really matter, along every step of this journey (Kementerian Pendidikan Malaysia, 2012).

The strategy is to focus on teaching and learning quality, access to reliable and meaningful information, transparent accountabilities and appropriate learning environments and infrastructure. The Blueprint has 11 strategic and operational shifts that need to be achieved. On shift 7, leverage ICT to scale up quality learning across Malaysia focuses to provide internet access and virtual learning environment via 1BestariNet for all 10,000 schools by 2013, augment online best practices content starting with a video library of best teachers delivering lessons in critical subjects in 2013 and maximise use of ICT for distance and self paced learning to expand capacity and allow for more customised learning (Kementerian Pendidikan Malaysia, 2012).

One of the factors that determine the development and innovation in public education is the teachers because they are the people who use ICT investment for the development of education.

This is because the technology does not have an educational value in itself. It becomes important when teachers use it in their learning-teaching process. Research results revealed that although there are some who claim that the presence of technology in the classroom creates a pressure and requires effective use (Kozma, 2003), it is also related to teachers' attitudes and levels of knowledge (Paraskeva *et al.*, 2008).

1.1. Problem Statement

In a study done by Asan (2003) in Turkey, its results showed that many teachers were not computer users. From the study, it was found that only 10 percent of the sample was computer literate. Majority of the teachers did not have the basic foundation of computer literacy, hence difficult to build new technological skills. Furthermore, the study revealed the gender, teaching experience and school teaching had a significant relationship with familiarity to computer technology in the country of study.

Yusuf (2005) reported that teachers in Nigerian secondary schools are not competent in basic computer operations and in the use of the generic software. If teachers are expected to integrate ICT into the school curriculum, preparations must be made at the pre-service teacher education level. Teacher preparation programmed should focus on the need for student-teachers to have ICT skills for their own use, in the preparation of materials for teaching and learning activities: the need to facilitate the direct use of ICT in students' learning activities within the classroom situation, and the need for teachers to develop in their students a critical awareness of ICT applications and the social implications (Robbins, 1998).

The literature suggests that lack of adequate training and experience is one of the main factors why teachers do not use technology in their teaching. This also results in teachers' negative attitude towards computer and technology. In addition, lack of confidence leads to reluctance to use computers by teachers (Kumar and Kumar, 2003).

1.2. ICT in Teaching-Learning Process

In a society, teachers have very important roles. The roles they play in the education process are central to basic education, in particularly more in Third World countries. A daunting challenge facing the education system is lack of competent teachers who are literate or proficient in the use of information technology. Information Communication Technology (ICT) proficiency is the ability to use technology tools and networks to define an information need, to access, to manage, integrate and evaluate information. The ability to access, evaluate, organise and use information from a variety of sources is known as Information literacy (Humes, 2003). As agents of change, it is important that teachers are ICT literate as this could bring about a lot of positive attitude towards the use of computer and information technologies.

Regardless of the quantity and quality of technology available in classrooms, the key to how ICTs are used is the teacher. Hence it is important that teachers are competent and have the right attitude towards technology (Kadel, 2005). A school could have ICT hardware and software, but whether used efficiently will depend on the teachers. It will depend on the teachers' beliefs and experiences, levels of knowledge, attitude towards ICT, educational applications, the expected

outcomes and the teaching and learning approach (Thomas and Stratton, 2006). High levels of knowledge, value, skill, personal dispositions, sensitivities and capabilities, will determine the ability to put those combinations into practice in appropriate way (Commonwealth Department of Education, 2002). An ICT competency describes what a teacher should know to be able to use technology in his or her professional practice.

Some major ICT competencies that teachers require were highlighted by Kirschner and Woperies (2003). These include competency in making personal use of ICT, mastery of a range of educational paradigms that make use of ICT, making use of ICT as minds tools, using ICT as tool for teaching, mastering a range of assessment paradigms which involves use of ICT, and understanding the policy dimensions of the use of ICT for teaching and learning (Robbins, 1998).

In order to successfully impart knowledge to students, it is important that teachers are well equipped with the knowledge that they need. The central question is, do teachers have the required knowledge of ICT? There are studies which reveal that teachers do not acquire the necessary level of knowledge. Findings by Rosnaini and Mohd Arif (2010) show that a minority group of teachers were knowledgeable in basic ICT. The majority of them only had average knowledge in ICT or very minimal knowledge of ICT. This scenario clearly shows that the key factor in making ICT programs successful in school is to upgrade the level of ICT knowledge among teachers (Moganashwari and Parilah, 2013).

ICT is a tool that can be used across the curriculum or in separate subjects where the emphasis is on the development of ICT-related skills, knowledge, processes, and attitudes (UNESCO, 2007). It enhances the learning outcomes of students within the limits of the existing curriculum and also a potential tool to transform the teacher-based classrooms into learner-focused, rich and interactive learning environments. Teachers are the key elements in this transformation based on the acceptance of ICT learning and teaching tool in schools.

According to (Albirini, 2006), teachers' attitudes toward computer technologies are also related to teachers' competence in using the technology. In addition, they have a significant impact on the openness to new experiences, and also reflect and implement the changes. Positive attitude towards ICT, though too limited support their use in classes. ICT should be effectively used in classrooms as this would serve justice to the investments made for the ICT to be available in the classrooms.

1.3. Purpose of Study

The study aims to investigate the levels of knowledge and attitudes towards ICT and the use of ICT by the teachers in schools in Malaysia. The research questions addressed in the study are as follows:

1. What are teachers' levels of knowledge on ICT?

2. To what extend are in-service teachers knowledgeable about the educational application of the ICT?

3. What are the attitudes of in-service teachers towards the use of ICT?

4. What are the obstacles or challenges faced by the in-service teachers in using ICT in teaching and learning process?

2. METHOD

A questionnaire was used to collect evidence from teachers about their ICT experiences, knowledge and use in teaching-learning process, their attitudes to the value of ICT for teaching and learning, the training they had received and, the obstacles faced by the teachers in using ICT. The questionnaire was broken down into six sections.

Section I: Respondents' Demographic Background

In the first part, gender, teaching experience, using computer experience and training level of the respondents were studied. These questions were looked at in order to ascertain the socio-demographic level of the respondents in the research.

Section II: Knowledge on ICT

In the second part, the respondents were asked to rate their knowledge on ICT skills such as spreadsheet, software, e-mailing, internet and maintenance.

Section III: Attitude towards ICT

This section demonstrates the attitude of respondents on ICT use. The scales were ranked from strongly disagree, neutral, agree and strongly agree.

Section IV: ICT Use

In this part, respondents were required to respond to how frequent do they use ICT tools and courseware, and skill level using courseware in teaching and learning and tools which were often, seldom and never.

Section V: Experience with ICT

In this part, respondents were required to respond to how often do they integrate computer technologies in their teaching activities and how many hours per week do they spend using the computer for personal use outside of teaching activities.

Section VI: Obstacles and Challenges Using ICT

The data obtained were collected from the respondents themselves and the relevancy of data were reliable as the researcher herself engaged in the collection of data.

3. FINDINGS

3.1. Demographic Background

Most of the respondents in this survey group were females who represent 86% of the sample and 14% of the respondents were males. This representation clearly reflects that the majority of the teachers in the teaching profession in Malaysia were none-other than women. As for the teaching experience, 72% have been teaching for less than 10 years and 28% have been teaching more than 10 years. Only 2% of the respondents have been using computer for less than 5 years. The majority

of the respondents has been used the computerfor more than 5 years comprises of 98%. The majority of the respondents which 68% have received formal training and 32 % of them did not receive any formal training for computers.

Table-1. Gender

Gender	No. of respondent	Percentage (%)
Male	7	14
Female	43	86

Table-2. Teaching experience

Teaching experience	No. of respondent	Percentage (%)
Less than 10 years	36	72
More than 10 years	14	28

Table-3. Using computer

Using computer	No. of respondent	Percentage (%)
Less than 10 years	1	2
More than 10 years	49	98

Table-4. Formal training

Formal training received	No. of respondent	Percentage (%)
Yes	34	68
No	16	32

3.2. Knowledge Level Possessed by In-Service Teachers in Using ICT

Research Question 1: What is the knowledge level possessed by in-service teachers in using ICT?

The responses from the respondents were rated from no capability, fair, good, and excellent. The results on knowledge level possessed by in-service teachers in using ICT are shown in Table 5 below. 68% of the respondents possess good knowledge on spreadsheet as it is the one of the most important and common application used by respondents in their teaching and learning process. Only 24% respondents rate themselves as excellent in using Spreadsheet such MS Word processing and MS Excel. Only 8% regard themselves have fair on capability using the spreadsheet. Majority of the respondents have good knowledge and excellent on PowerPoint application which comprises of 90% as they are often required doing presentation during their studies and also attending courses. 38% of the respondents have acquired excellent knowledge on graphics software and 40% of the respondents have good knowledge on the application of graphic software. As for knowledge on internet browsing most of the respondents have fair knowledge on it.

Table-5. Knowledge level possessed by in-service teachers in using ICT

Statement	Excellent %	Good %	Fair %	No capability %
Spreadsheet	24	68	8	0
Presentation software	32	58	10	0
Graphics software	38	40	58	2
Computer maintenance	36	48	16	0
Using the internet to effectively and efficiently search for information	2	18	62	18
Evaluating the reliability and credibility of online sources of information	4	30	56	10
Understanding the ethical and legal issues surrounding access to and the use of digital information	8	38	48	6

3.3. Attitudes among In-Service Teachers towards the Use of ICT

Research Question 2: What are the attitudes among in-service teachers' towards the use of ICT?

Most of the items are agreed upon by the respondents concerning the attitude towards ICT. 50% of the respondents agree that they feel comfortable using ICT as a tool in teaching and learning. A majority of the respondents agreed that the use of computer does stress them out. A large number of respondents 66% stated that they do not know how to fix it if something goes wrong. Only a handful of them agree (64%) and completely agree (2%) that they know how to fix it if something goes wrong. 84% of them are neutral to the statement that the use of ICT in teaching and learning excites them. 74% of the respondents agree and 26% of the respondents completely agree that the computer is a valuable tool for teachers.

The majority of the respondents completely agree that the computer will change the way students learn in classes. 78% of the respondents disagree that the ICT is not conducive to student learning because it is not easy to use. The statement computer helps students understand concepts in a more effective way is agreed by 64% of the respondents and completely agree by 28% respondents respectively. The majority of the respondents 74% agree that computer helps teachers to teach in more effective ways and 24% of them completely agree to the statement. More than half which is 78% of the respondents disagree that computer is not conducive to good teaching because it creates technical problems and only 14% of the respondents agree with the statement.

3.4. Level of ICT Use for Teaching-Learning Process

Research Question 3: What is the level of ICT use for teaching-learning process by teachers?
Table 7 shows the result of ICT used for educational purposes by teachers. Almost half, 54% of the respondents responded that they seldom use it for teaching and learning specific subjects. This reflects that majority of the respondents 58% seldom use it to teach computer skills. As for finding and accessing information and educational materials 72% of the respondents often use it and 40% of the seldom use ICT. 26% of the respondents who do presentations often use ICT and only 30%

of the respondents often use ICT for preparing lesson. 72% of the respondents seldom use ICT to communicate with students but 38% of the respondents communicate with other teachers using ICT. As for monitoring and evaluating students' progress or keeping track of students performance 62% of the respondents often use ICT and as for report preparing 80% of them use it often too. It can be concluded that the results portrait that the respondents often use ICT for majority purposes.

Table-6. Attitudes towards ICT

Item	Strongly Agree %	Agree%	Disagree %	Strongly disagree %
It is very important to me to work with a computer.	46	50	4	0
I think playing or working with a computer is really fun.	62	34	4	0
I use a computer because I am very interested.	36	54	10	0
I lose track of time when I am working with the computer.	26	24	42	8
I feel comfortable using ICT as a tool in teaching and learning.	32	64	4	0
The use of computer stresses me out.	6	18	44	32
If something goes wrong I will not know how to fix it.	2	64	34	0
The use of ICT in teaching and learning excites me.	8	84	8	0
The computer is a valuable tool for teachers.	26	74	0	0
The computer will change the way students learn in my classes.	28	64	8	0
The ICT is not conducive to student learning because it is not easy to use.	2	12	78	8
The computer helps students understand concepts in more effective ways.	24	74	2	0

Table-7. Level of ICT used for teaching and learning by teachers

Item	Often %	Seldom %	Never %
Teaching –learning for specific subjects	38	54	8
Teaching computer skills	10	58	32
Finding and accessing information and educational materials	26	72	2
Making presentation	32	62	6
Preparing lessons	30	68	2
Communicating with students	20	72	8
Communicating with other teachers	38	56	6
Monitoring and evaluating students progress or keeping track of students performance	20	62	18
Preparing reports	80	18	2

3.5. Obstacles Faced By the In-Service Teachers in Teaching-Learning Process

Research Question 4: What are the obstacles or challenges faced by the teachers in using ICT?

Majority of the respondents, 24% of them claim that they often have problem in technical support. Whereas, 64% of the respondents face the obstacle when lacking time in school to fully utilize the ICT infrastructure. 70% of the respondents do agree that sometimes they have limited knowledge on how to make full use of the ICT. Majority of the respondents, 70% of them seldom have limited understanding on how to integrate ICT into teaching. 76% of the respondents sometimes face challenges when there is lacking of software or websites that support teaching and learning ICT and whereas, 70% of the respondents also claim that sometimes they face the obstacle in lack of computer or tool in school.

Table-8. The obstacles faced by the in-service teachers in teaching-learning process

Item	Often %	Sometimes %	Seldom %
Lack of technical support	24	70	6
Lack of time in school	28	64	8
Limited knowledge on how to make full use of ICT	12	70	18
Limited understanding on how to integrate ICT into teaching	6	70	24
Lack of software or websites that support teaching and learning	6	76	18
Lack of computer/ tool in school	14	62	24

4. DISCUSSION

The findings of the study can be summarized under four headings, which are the level of knowledge in-service teachers possess in using ICT, the attitudes that the teachers possess towards ICT, the level of ICT used for educational purposes by the teachers and the obstacles faced by teachers in using ICT. The study may help to overcome these obstacles and become successful technology adopters in the future.

The first shows the knowledge level possessed by teachers' in using ICT. The knowledge level of the teachers was investigated through the first research question. The results reveal that the teachers' level of knowledge on ICT is moderate as they were only good at using certain applications such as spread sheet, presentation software and e-mailing as these are the main applications which are commonly and often used in the teaching profession. The results seem similar to research done by Rosnaini and Mohd Arif (2010) where minority group of teachers were knowledgeable on ICT. Study by Moganashwari and Parilah (2013), also confirms this research as the findings of the study reflects that the respondents were highly knowledgeable only on certain applications such as word processing and internet browsing.

The second finding is related to attitudes, which demonstrate that teachers' attitude are positive. This result is in compliance with research carried out by Lau and Yeoh (2008),Melor (2007) and Samuel and Zaitun (2007). These studies show that the majority of respondents have a positive attitude towards the use of ICT in teaching.

The third finding concerns about the use of ICT in teaching-learning process by teachers. The analyses revealed that more than half often used ICT to teach computer skills, do presentations, communicating with other teachers, monitoring and evaluating students' progress or keeping track

of students' performance and preparing reports. This finding is parallel to Samuel and Zaitun (2007) studies showed that when respondents have a positive attitude towards ICT, and therefore the level of ICT is high as well as the respondents are motivated to use ICT for educational purposes.

This research also looks at the obstacles faced by the teachers in using ICT. The results shows that teachers have a strong desire to integrate ICT in education; however, they face many obstacles.

The majority of respondents had an issue with the lack of time in the school to use ICT as they are burdened with other responsibilities. Lack of technical support, lack of tools and knowledge on how to make full use of ICT were also barriers or challenges faced by the teachers. These finding is in line with study by Moganashwari and Parilah (2013).

5. CONCLUSION

Teachers' knowledge on how to use these technologies in the learning-teaching process has an important effect on using them effectively. Attitudes have also important effects on teachers' use of these technologies. Given that those with less years of experience had higher levels of knowledge and more positive attitudes, as ICT experience increases, their attitudes also improve, which is a very important result as it shows that continuous teacher training is a significant factor in the effective use of ICT in learning-teaching process.

Teachers' positive attitude towards ICT is important and also an added advantage to the implementation of ICT related programmes. The effective implementation of ICT programmes clearly depends on teachers' readiness and also positive attitudes towards ICT and those who perceive it to be useful in promoting learning will surely integrate ICT more easily (Papanastasious and Angeli, 2008)

Teachers in Malaysia need intensive training in the use of information technology (IT) to facilitate its integration into classroom activities in ways that enhance thinking and creativity. The teachers also need to learn how to facilitate and encourage students to take charge of their own learning. The findings reveal that teachers still have difficulty in using certain applications such as MS Excel. For the longer term, recommended that to remain confident in their knowledge of technology applications, these teachers need to enhance their skills regularly and stay up to date through continual professional development. Furthermore, the teaching methods of all subject areas require a fresh orientation towards a more experiential and student-centered approach supported by interactive ICT multimedia tools and IT or Information Systems (IS) network learning.

There is a need to produce teachers who are comfortable with the adoption of technology in their lesson design and delivery. It is time for all to gear up and learn the required skills. Positive attitude motivates individuals use ICT effectively and further upgrade the needed skills. Future research could focus on two areas, specifically classroom observations to find out the actual use of ICT in teaching and learning process and the role of school administration in the integration of ICT in schools.

REFERENCES

Albirini, A., 2006. Teachers' attitudes toward information and communication technologies. The case of Syrian EFL teachers. Computer & Education, 47: 373-398.

Asan, A., 2003. School experience course with multimedia in teacher education. Journal of Computer Assisted Learning, 19: 21-34.

Commonwealth Department of Education, S.A., 2002. Striving for quality: Learning, teaching and scholarship, DEST No. 6891.HERC02A. Canberra: Australian Government Publishing Service.

Humes, B., 2003. Understanding information literacy. (In Tonubari Kpai, Josephine N. Joe-Kinanee and Chioma Ekeleme). Available from http://www.libraryinstruction.com/infolit.html [Accessed August 10, 2010].

Kadel, R., 2005. How teacher attitudes affect technology. Learning and Leading with Technology, 39(5): 34-47.

Kementerian Pendidikan Malaysia, 2012. Preliminary Malaysia Education Blueprint 2013-2025. Available from http://www.moe.gov.my/userfiles/file/PPP/Preliminary-Blueprint-Eng.pdf.

Kirschner, P. and I.G.J.H. Woperies, 2003. Mind tools for teacher. Technology, Pedagogy, and Education, 12(1): 127-149. Available from http://www.triangle.co.uk/jit/ [Accessed December, 23, 2003].

Kozma, R., 2003. ICT and educational change: A global phenomena in R. Kozima (Ed) A global perspective. A report of the second information technology in education study module 2: International Societies for Technologies in Education.

Kumar, P. and A. Kumar, 2003. Effect of a web-based project on preservice and in-service teachers' atti-tudes toward computers and technology skills. Journal of Computing in Teacher Education, 19(3): 87-92.

Lau, T.C. and K.H. Yeoh, 2008. Learning behaviour of university's business students in regards to gender and levels of study-an exploratory research. Proceedings of International Conference of Social Sciences and Humanities. Penang: Universiti Sains Malaysia.

Melor, M., 2007. Malaysian ESL teachers' use of ICT in their classrooms: Expectations and realities. European Association for Computer Assisted Language Learning ReCALL, 19(1): 79-95.

Moganashwari, K. and M.S. Parilah, 2013. Knowledge, attitude and use of ICT among ESL teachers. Proceeding of the Global Summit on Education. 11-12 March 2013, Kuala Lumpur. Organized by WorldConferences.net.

Papanastasious, E.C. and C. Angeli, 2008. Evaluating the use of ICT in education: Psychometric properties of the survey of factors affecting teachers teaching with technology (SFA-T3). Educational Technology & Society, 11(1): 69-86.

Paraskeva, F., H. Bouta and A. Papagianni, 2008. Individual characteristics and computer self-efficacy in secondary education teachers to integrate technology in educational practice. Computers & Education, 50: 1084-1091.

Partnership for 21st Century Skills, 2002. Learning for the 21st century. Washington DC: www.p21.org/storage/documents/P21_Report.pdf.

Robbins, V., 1998. The development of information technology skills in trainee teachers for further education sector. Research in Post-Compulsory Education, 3(2): 240-251.

Rosnaini, M. and H.I. Mohd Arif, 2010. Impact of training and experience in using ICT on in-service teachers' basic ICT literacy. Malaysian Journal of Education Technology, 10(2): 1-8.

Samuel, R. and A. Zaitun, 2007. Do teachers have adequate ICT resources and the right ICT skills in intergrating ICT tools in the teaching and learning of english language in Malaysia schools? The Electronic Journal of Information Systems in Developing Countries, 29(2): 1-15.

Thomas, A. and G. Stratton, 2006. What we are really doing with ICT in physical education: A national audit of equipment, use, teacher attitudes, support, and training. British Journal of Educational Technology, 37(4): 617-632.

UNESCO, 2007. The UNESCO ICT in education program. United nations educational, scientific and cultural organization (UNESCO): Bangkok, Thailand. Available from www.unescobkk.org/education/ict.

Volman, M. and E.V. Eck, 2001. Gender equality and information technology in education: The second decade. Review of Educational Research, 71(4): 613-634.

Yusuf, M.O., 2005. An investigation into teachers' self-efficacy in implementing computer education in Nigerian secondary schools. Meridian: A Middle School Computer Technologies Journal, 8(2): 4.