THE AWARENESS OF ICT USE FOR TEACHING AND LEARNING PROCESS EFFECTIVELY

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Abstract

Information, Communication, and Technologies (ICT) are always influence all aspects of life. The use of ICT has an importance role in work places, business, entertainment, moreover in education. It is as a certain thing which is needed due to support teaching and learning process. ICT can also create student-centered learning setting to be more active and creative. Besides, ICT can also develop the quality, accessibility, and learning motivation in education. Therefore, teachers have a very big role due to know how to integrate the technology into classroom practices. This paper discusses the importance of ICT use, benefits of ICT use, and barriers integration of ICT use in the class-room practiced. Therefore, the main purpose of this study is to develop teachers' and students' awareness of ICT integration due to achieve successful learning.

Keywords: ICT, Important, Effective, Educational Purpose

1. Introduction

The integration of technology in teaching and learning process is not a new idea. Information exchange among some other institutions have realized of its importance. The institutions have implemented the use of technology as well radio and television in the process of teaching. Dawes (2001) emphasized that technologies have potential to promote education for curriculum and give chances for effective communication between teachers and students.

Governments and education systems of the whole world have appreciated the use of information, communication, and technology (ICT) as a necessary issues for improving the effectiveness of teaching and learning (Plump, Anderson, Law & Qualex, 2009). On the other hand, there are still many teachers which are left behind of information, communication, and technology (ICT) use. Teacher did not know how to apply ICT use even they believed the benefits of ICT's integration. Besides,

Balanskat, Blamire and Kefala (2006) also argue that even teachers know the values of ICT use, difficulties also continue to the process of adopting these technologies.

Miller, Martineau, and Clark (2000) stated that technology-based teaching should not be as a principle in all classes yet commonly it is most provide relevant example and demonstrations, change the classroom orientation, improve flexibility. Therefore, the main purpose of using information, communication, and technology in teaching is to extend better impact to students' performance. As a teacher who teaches in this era, there must some pretension that must be implemented due to achieve the benefits of ICT application in teaching. Therefore, educators, teachers, and school principles must cooperate to overcome any obstacles of ICT integration on teaching and learning.

2. Result and Discussion

The Importance of ICT Use for Educational Purposes

Some studies claim that the use of new technologies in classroom is important in order to provide chance for students to operate in an information Era. Meanwhile, traditional education environments are not suitable to create students to be productive in the today's society workplace (Yelland, 2001). She stated that organizations which do not integrate the use of technologies in institutions cannot prepare their students for twenty-first century life students. The use of ICT in schools or institutions can prepare students to face future development based on well understanding. It means unconsciously students who are thought by ICT skill for each proper understanding are also prepared to face the further developments. Besides, Castro (2003) and Cathere (2000) mentioned that ICT is a learner preparation by developing cognitive skills, critical thinking skills, information access, evaluation and synthesizing skills. ICT is used to improve the efficiency in educational process. Therefore, ICT use is able to develop memory retention, increase motivation and generally deepens

understanding. Additionally, collaborative learning, such as role play, problem solving activities, and articulated projects would be applied by integrated ICT (Forcheri and Molfino, 2000). Therefore, the whole purpose of technology use in teaching is due to give well performance value to teachers and students. Wong, Quek, Divaharan, Liu, Peer, and Williams (2006) stated that technology plays a part in enhancing face-to-face teaching and learning in the classroom. It means the computer use help students to achieve knowledge, reduce direct instruction given, and opportunities to help students for particular needs. According to Grabe and Grabe (2007) stated that students can improve their skills, motivation, and knowledge by applying technology. Therefore, ICT use is crucial for students due to get information and helps them to complete learning task.

Teachers are expected to create well use of modern teaching technology and develop teaching resource effectively. Becta (2004) mentioned there were five factors which can influence students' good ICT use such as ICT resourcing, ICT leadership, ICT teaching, school leadership, and general teaching. He also mentioned that students can integrate technology successfully into education varies from curriculum, place, and class, depending on the manners in which it is applied. Besides, Peck and Domcott (1994) mentioned ten reasons about the importance of technology use in school: (1) individual instruction of technology will be had by the teacher; (2) students must be good at accessing, evaluating, and communicating the information; (3) the quality and quantity of students' thinking and writing in using word professors can be increased; (4) students develop their critical thinking by organizing, analyzing, interpreting, developing, and evaluate their own work by using technology; (5) students' artistic expression can be encouraged by using technology; (6) technology enables students to get many resources outside the school; (7) students will have new and exciting learning experience; (8) become an important part of students' world can make students to feel comfort in using computer; (9)students have opportunities to do meaningful work; (10) students must increase their productivity and creativity.

Benefits of ICT Use in Science Education

Several research studies reported some benefits from ICT use for science learning. Firstly, the benefit is enhancing the encouragement of communication and collaboration in science research activities (Bingimlas, 2009). Students who learn by using ICT can develop their knowledge by collecting and interacting the information with various resources, such as video and image. ICT use has good impact to students in order to be used in primary science education at school (Gillespie and Murphy, 2006). Therefore, in teaching and learning activities students and teachers must be accustomed to socialize internet technology as early as in primary science. They both will know how to earn reference source and means of communication. Furthermore, it will also improve students' learning motivation, clearer thinking, and increase interpretation skill from the data collected.

Al- Alwani (2005) also mentioned the benefit of ICT use in science education is that enlarge the available resources for science teachers. Murphy (1996) summarized five learning outcomes which are resulted by the technology use in the classroom as following: (1) social growing, (2) problem solving, (3) peer teaching, (4) independent work, and (5) exploration. Therefore, ICT is as a tool which can facilitate science teachers to create various materials from information, communication, and technology such as internet. It has some variation methodology and material sources as well sounds or videos. Besides, ICT include some benefits tools which are data capture, multimedia software for simulation, publishing and presentation tools, digital recording equipment, computer projection technology, and computer-controlled (Osborne & Hennessy, 2003).

Barriers of ICT Integration in Education

Although the use of information, communication, and technology has a lot of benefits for some teachers and students in educational sides, (Osborne & Hennessy, 2003) also suggested that we cannot totally depend on that ICT will transform the

science education well. In reality, teachers and students did not apply effective way in utilizing the internet technology when learning and teaching science. They tend to be expert in searching other information rather than receiving facts. Furthermore, they do not aware the importance of world around them, citizenship, and literate community (Pickersgill, 2003, p. 86). Integrating ICT into teaching and learning needs some various difficulty processes. These difficulties are known as "barriers". A barrier is meant as "many difficult situation which has difficult progress in order to reach an objective (Schoepp, 2005, p. 2). As suggested before, here are some barriers which is faced by some teachers and students when collate ICT into education (Becta, 2004). There are two different sides of barriers such as teacher-level-barriers and school-level barriers. Teacher-level-barriers are related a grouped as lack of time, lack of confidence, and resistance to change. While, school-level- barriers are lack of effective training in order to solve technical problems and lack of access to resources. Here are the detail information between teacher-level-barriers and school-level-barriers.

Teacher-level-barriers

Lack of teacher confidence.

Some researchers mention those teachers' barriers in implementing ICT use is because of lack of confidence in teaching. Competence in computer is meant as being able to understand several of computer applications purposes (Tondeur, Valcke, & Van, 2008). A major predictor of integrating ICT in teaching is teachers' computer competence. Teachers tend to be awkward to socialize ICT is just because of the unaccustomed and in confidence with the technology use in their daily life. Basically, little understanding about technology use cannot support students' achievement in gaining information. Therefore, teachers even never try to apply it. According to Becta (2004), he said that the main barrier to the understanding of ICT used by some other teachers' response is because of low confidence. Besides, Beggs (2000) also

emphasized that most of failure fair happened caused by lack of confidence in ICT use. Therefore, teacher has limitation of knowledge about ICT use which makes them not confidence in apply it. Confidence directly relate to teacher competence. Teachers' perceptions of the ability to use computers in classroom also relate to confidence. In the conclusion, well skilled of ICT use is not considered by some teachers. They consider that students perhaps know more than they do. Therefore, teachers afraid of socializing ICT in the classroom with limited skills and experience in the area of internet, computer, and communication. Thus, teachers who understand and aware of the ICT use in the classroom will be confidence and extend it for further teaching and personal work activities.

Lack of teacher competence in ICT use

Lack of competence is one of the barriers which also related to teachers' confidence. Integrating teaching with the ICT practice of the classroom will bring teacher with high confidence of teaching pedagogical. Teacher who has knowledge and skill in using internet, computer and technology will be more enthusiastic with the chances and integration in teaching practices.

Pelgrum (2001) and Al-Oteawi (2002) mentioned that there are some different levels of barriers for one country to another. In developing countries, teachers' lack of technological competence is a main barrier for accepting and adopting ICT in teaching activities. It means even teachers who are living in developing country, they still have difficulties to accept and adopt ICT. Several researchers reported that teachers' lack of ICT is as a main barrier. Besides, it is serious problem due to integrate technologies in science education. According to Empirica (2006) survey reported that teacher who do not use computer in classrooms is claimed as lack of skills teacher. In addition, Pelgrum (2001) stated that primary and secondary school teachers have serious obstacle to use ICT. Mainly, not so many teachers chose to use ICT and media in teaching activities because of their lack of ICT skills.

Resistance to change negative attitudes

Attitude is a positive or negative emotional reaction in a specific situation. While, Fishbein (1967) defined that attitude is the predisposition of a learner to respond an object and class objects consistently in favorable or unfavorable way. Teachers' attitude toward technology use in teaching and learning process is the main factor which must be considered. The success of educational technology implementation in school's program depends on teachers' attitude. The success of technology use in educational setting depends on the teacher attitude in using technology. Thus, teachers' attitude related to the frequency and amount of technology usage. Teachers can provide useful adoption and integration of ICT use in teaching and learning process when positive attitude is insight of their self. Akbaba, Kurubacak (1999) and Huang, Liaw (2005) stated that teachers' acceptance through the usefulness of technology integration is influenced by attitude toward computers. Thus, Knezek and Christensen (2000) stated "the likeliness of teachers integrating technology, and its effective use and implementation, was very much related to the users' attitudes toward the computer and technology". There is positive relation between teachers' computer experience and computer attitudes. Rozell and Gardner (1999) stated that the more experience teachers have with computer, the more they will show positive attitudes toward computer. Gomes (2005) found that the resistance of science teachers to chance ICT strategy use is still serious problem. The resistance from changing common setting of teaching way to using technology in education is as important barriers. It means the main key of teachers' attitude towards the use of technologies is as the understanding of how the technologies will advantage their teaching to the students. In other side, some opinion stated that teachers who do not use technology in their classroom teaching are still in the opinion that there is no significant benefit that they can get. Besides, teachers' consideration that is unlikely to socialize new technologies in the teaching activity if they see no need to change their professional practice. It is also supported by Schoepp's study

(2005) found that, teachers' consideration that there was more than enough technology available, and they believed that they were not being supported, guided, or rewarded in integrating the technology into their teaching activities.

There should be many a many encouragement forces such as the power of new developments, rapid availability, creativity, Internet access, and communication due to change to negative attitude, while there should be discouragement force such as lack of technical support, teacher expertise, time planning (Earle, 2002).

School-level barriers

Lack of time

In the condition, many teachers who have competence and confidence in using computer in the classroom, but they still have obstacle to use little technology in the process of teaching is just because of time limitation, for example, they have difficulties in scheduling the time for each classes to use computer in learning. Therefore, lack of time is also one of a barrier to use ICT. According to Becta (2004) found that there are many aspects for lacking of time problem which existed, such as, time allocation of internet advice, lesson preparation, explore and practice technology use, technical problem and receive adequate training.

Lack of time an important factor related to the application of technologies in science education. Alwani (2005) concluded that lack of time barrier affect the application of ICT in Saudi Arabia because of busy schedule. Besides, Sicilia (2005) found that most Canadian teachers need extra time due to prepare and design materials project which include the use of ICT rather than prepare traditional lessons. Gomes (2005) concluded that the main reason that science teacher do not use ICT in the classroom is because lack of time to accomplish the plans for learning activity.

Lack of effective training

Pelgrum's (2001) found that there were not enough training chances for teacher to use ICT in a classroom environment. Most of teachers are left behind to the technology support due to enlarge teachers' and students' information. Science teacher must be facilitated to the in-services programs related to ICT use. Some teacher who has known how to use ICT will develop their skill by collaborating the previous skill and newest information that they have just got. While the teachers who have no any background skills of ICT use will apply it to the real teaching activities. Teacher education can also play a significant role to provide chance for experimentation with ICT before using it in the classroom teaching.

Providing pedagogical training for teachers is more important than simply training them to use ICT tools (Becta, 2004). Besides, Cox, Preston, Cox (1999) stated that teacher still did not know how to use ICT in the classroom even they had attended the professional development courses using technologies. Instead, they just know how to operate computer and set up printer. Inappropriate teacher training does not help teacher to use ICT in the classroom, but the appropriate teacher training in specific ICT skill is more important (Balanskat, Blamire & Kefala, 2006). Newhouse (2002, p. 45) stated that "teachers need to not only be computer literate but they also need to develop skills in integrating computer use into their teaching or learning programs".

Lack of accessibility

Access to get resources is one of certain barriers which cause teachers to have low intended to integrate new technologies in science education. Therefore, infrastructure and integration access in school is importance condition which must be considered (Plomp, Anderson, Law & Quale, 2009). Besides, home access of technology understanding such as hardware, software, etc are as the main first example due to build teachers' motivation for integrating and adopting technology in

school successfully. Therefore, when teachers have access of implementing technology at home, they will curious to apply it in the classroom. Most of teachers complain that they have difficulties to always access the computers. Computer must be booked firstly before in advance use, in the contrary teacher sometimes forget to do so. Besides, they sometimes could not book them in several times even when they want to do the projects with students. This happened is because of poor organization of resources, poor quality hardware, inappropriate software, and lack of personal access for teacher (Becta, 2004). Therefore, the inaccessibility of ICT resources is not always merely for non-availability of hardware, software, and other ICT material from school.

Barrier to the lack of technology access is different from country to country. In European study for example found that teachers' barrier in different ICT use (Empirica's, 2006). Besides, Pelgrum (2001) concluded that there were four main barrier of accessibility such as, insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient simultaneous. Toprakci (2006) also mentioned some accessibility in Turkish school that there were low numbers of computers, oldness or slowness of ICT systems, scarcity of educational software in the school due to implement ICT in science education successfully.

Lack of ICT infrastructure, lack of high quality of hardware, suitable educational hardware, and access to ICT resources are also as the barrier of resources accessibility. Merely, it does not guarantee the successful of ICT implementation in teaching (Balanskat, Blamire & Kefala, 2006). In a conclusion, access limitation to hardware and software resources influence teachers' motivation to use ICT in the classroom (Osborne and Hennessy, 2003).

Lack of technical support

Without technical support and resources in the classroom, barriers cannot be prevented by the teachers due to ICT use. Pelgrum (2001) mentioned that lack of technical support is in the top barrier in the primary and secondary school teacher. Teachers tend to lose their prepared lessons resource when the barriers of technical support happed in the teaching activities. Sicilia's study (2005) mentioned some technical barriers which probably happened such as; waiting for websites to open, Internet connection problem, printer does not running well, malfunctioning computer, and old computer available use. Therefore, she agreed that technical problem is as a major barrier for teachers.

Korte and Husing (2007) stated that teachers are helped when the ICT support and maintenance is used. They will not lose their time due to fix the software and hardware problems. Therefore technical support and maintenance must be handled well in order to decrease the high risk of the technical problems. Teachers are afraid that the technical support will break down during the lesson. Besides, technical breakdowns tend to decrease teachers' motivation to use ICT in teaching activities. Therefore both teachers and students should cooperate together due to decrease the technical support happen.

Gomes (2005) said that technician must be available in the school environment due to integrate the ICT use. Related to previous research mentioned if the technician is available in school, teacher will not judge that ICT integration is as an obstacle in teaching. Toprakci (2006) stated that technical support is one of the ICT barriers integration. He also mentioned that it is a serious problem which must be overcome by every science school teachers. Therefore, teachers must be introduced to the computer technology in science teaching, even they believe that they will experience to the problem of hardware running and technical service (Almohaissin, 2006).

In the conclusion, there are some various barriers of ICT integration among some science teachers around the world. The barriers are lack of computers, lack of quality software, lack of time, technical problems, teachers' attitudes towards computers, poor funding, lack of teachers' confidence, resistance to change, poor administrative support, lack of computer skills, poor fit with the curriculum, lack of incentives, scheduling difficulties, poor training opportunities, and lack of skills in integrating ICT in education (Bingimlas, 2009).

3. Conclusion and Remark

The aim of this paper was to provide information on the importance, benefits of ICT integration and aware through some barriers of ICT integration. ICTs for education refers to the development of information and communications technology specifically for teaching or learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in teaching and learning process. The success of ICT integration depends on the available of technology and pedagogical design. ICT use has a positive impact on students' achievement and performance. It provides rich environment and motivation for teaching and learning process. Mostly, teachers have a strong desire for the integration of ICT in education but there are some barriers that they must encounter. There are two different sides of barriers such as teacher-level-barriers and school-level barriers. Teacher-level-barriers are related a grouped as lack of time, lack of confidence, and resistance to change. While, school-level- barriers are lack of effective training in order to solve technical problems and lack of access to resources.

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