INFORMATION AND COMMUNICATION TECHNOLOGY AS A CHANGE AGENT FOR EDUCATION

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ABSTRACT

Education is a very social oriented activity which becomes the key development targets for countries around the world. . ICT has become the commonplace in all aspect of life, One of those aspects is in education. The use of ICT in education develops higher order thinking skills. Teaching with technology is an interactive learning to engage the students with higher order thinking. As the world develops, every job in the future will require applicants to have some technical skills. So the use of technology in education prepares our children for tomorrows advanced working conditions. Considering this, making good quality, accessible, and affordable education to the learners is necessary When ICT is applied to education, ICT can positively impact in some parts. However, In this modern era, still many Indonesian schools still employ traditional instructions without having access to latest trends on the ICT. Which resulted students can't improve their high order thinking in the process of teaching learning.The integration of ICT in learning and teaching process builds on the professional attitude and willingness of the individual teacher and principal. The paper argues the use of ICT is effective in transforming teaching and learning, and seeks to explore how this will be offered and delivered in the educational institutions in the future.

Keywords: *Education, ICT, learning and teaching process.*

INTRODUCTION

One of the many challenges facing developing country today is preparing the society and government for globalization and use of Information and Communication (ICT). As Tinio (2000) stated in his study, the e-ASEAN Task Force and the UNDP Asia Pacific Development Information Programme (UNDPAPDIP) share the belief that with enabling ICT, countries can face the challenge of the information age. Globalization and technological change have created a new global economy "powered by technology, fueled by information, and driven by knowledge."1 The emergence of this new global economy might have serious implications for the nature and purpose of educational institutions. Global changes also put pressure on all groups to constantly acquire and apply new skills. The International Labour Organization defines the requirements for education and training in the new global economy simply as "Basic

Education for All", "Core Work Skills for All" and "Lifelong Learning for All"2. From those statements, ICT could be a way to reach the requirements for education in this global change.

ICT or Computer is the student's necessary which provides an excellent tool to be a creative and innovative students in the process teaching and learning in the class. Because its interactive capabilities and its ability to present and stimulate problems.

Information and communication technology (ICT) has changed many aspects of the way people live. ICT which include radio and television, as well as newer digital technologies such as computers and the Internet, have been touted as potentially powerful enabling tools for educational change and reform. When used appropriately, ICT help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality by, among others, helping make teaching and learning into an engaging, and active process connected to real life.

However, the experience of introducing ICTs in the classroom and other educational settings all over the world suggests that full realization of the potential educational benefits of ICT is not automatic. The use of ICT into the educational system becomes complex. There have been number of lack factors of the implication. Such factors as a lack of funding to support the purchase of the ICT, a lack of training among teaching practitioners, a lack of motivation and need among teachers to adopt ICT as a teaching tools.

Computers and applications of technology became more pervasive in society which led to a concern about the need for computing skills in everyday life, especially in education. Hepp, Hinostroza, Laval, and Rehbein (2004) claim in their paper "Technology in Schools: Education, ICT, and the Knowledge Society" that ICT have been utilized in education ever since their inception, the commonly accepted rhetoric that education systems would need to prepare citizens for longlife learning in an information society boosted interest in ICT (Pelgrum, W.J., Law, N., 2003). That is why ICT act as a powerful agent to change many of educational practices to which we have become accustomed.

In particular, the paper will explore the impact of ICT will be likely to have in coming years on who use the ICT, what is learned with ICT, and proof that the ICT is a change agent for education.

RELATED WORK

The use of information and communication technologies in the educative process has been divided into two broad categories: ICTs for education and ICT in education. ICT for education refers to the development of information and communications technology specifically for teaching and learning purposes, while ICT in education involves the adoption of general components of information and communication technologies in the teaching learning process.

A. Goals of ICT in education

One of the Millennium Development Goals (MDGs) is achievement of basic education, building on the Education for All (EFA) initiative begun in Jomtien (Thailand) in 1990, and reaffirmed at a second EFA meeting in Dakar in 2000 (Wagner 2005).

In receiving the achievement of MDGs, ICT is used to help unlock the door to education. Within the education sector, the importance of ICT is potential to increase the access to knowledge and improve the quality of instruction for marginalized or traditionally population.

Some goals of the using of ICT in education are (Wagner 2005):

1) Achieving basic education
2) Building the Education for All (EFA)

B. Potential impact in the use of ICT in education

Technology advocates describe a range of potential impacts that ICT can have when applied to education. These include (Kozma 2005):

- *Student outcomes*
- *Teacher and classroom outcomes*
- Other outcomes

With the promise of these outcomes, governments in developing countries have put computers in schools and connected them to the Internet, provided students with multimedia tutorials and simulations, trained teachers and given them access to new resources, provided schools with management and productivity tools, and established community technology and multimedia centers in villages.

In this case, many advantages of using ICT in the classroom while learning process:

1. Technology Unlocks Educational Boundaries:
   Technology supports Virtual or Online Learning. Unlike physical classrooms, online learning is flexible and students from different geographical locations can attend the same class with no need of traveling from those locations.
2. Technology Simplifies Access to Educational Resources:
   Technology helps students gain access to open educational resources. These resources are kept under the public domain and are freely available to anyone over the world-Wide-Web. These educational resources include electronic books (e-books) , pod-casts, digital libraries, educational games, educational videos and instructions, tutorials and much more.
3. Technology Motivates Students:
   The use of computer based instructions makes students feel in control of what they learn. Students find it easy to learn with technology because computers are patient compared to humans. Teachers publish educational instructions on classroom blogs or they assign research work via email, and this gives a student time to study on their own and have no fear of making mistakes during the process of learning.
4. Technology Improves Students Writing and Learning Skills:
   The use of computers in the classroom has helped many students learn how to write well composed sentences and paragraphs. Computers have word processing applications which students use to take notes in the classroom, these word processing applications have built-in dictionaries which help students auto-correct spelling errors and also correct their grammar in a sentence.

5. Technology makes subjects easy to learn:

   Different types of educational software are designed to help students learn various sub-jects easier. Many students complain that learning Math is difficult, so some of them have decided to use educational Math software like BrainingCamp. Students can use BrainingCamp to apply their Math knowledge and skills to solve different math equations.

6. Promotes Individual Learning:

   Technological tools like cell phones and internet give students an opportunity to learn by them selves. Many students prefer teaching them selves and discovering content by them selves, this process allows them to test various options to solve a given task at school.

7. Supports Differentiated Instructions:

   Teachers can use technology to cater for each and every student's needs in the classroom or out side of the classroom. The use of classroom assessment software and performance tracking programs helps teachers plan for each student basing on their performance and learning capabilities.

8. Increases Collaboration between Teachers and Students:

   The use of advanced communication technologies in education helps teachers reach their students easily and it also helps students reach their teachers or fellow students in real-time.

9. Increases Students Innovation and Creativity:

   Many teachers have discovered that integrating technology in their classroom increases student's engagement in the classroom. So now they put up technological competitions where students can make small educational technologies like robots, smart-pens, mobile applications and much more.

DESIGN OF THE STUDY

The paper will explore the impact of ICT will be likely to have in coming years on who use the ICT, what is learned with ICT, and proof that the ICT is a change agent for education.

The sample of this study included 7 teachers who were teaching in the school in Pondok Kelapa during the academic year 2014-2015. The average age of the teacher participants was 27 years of age, with minimun age of 23 years and maximum age of 32 years. On a average, the teachers in the sample had 5.67 years of work experince, with maximum of 9 years of experince. Almost 71% of the teachers in the sample were females, while the remaining 29% were males. In term of computer usage and experience, 100% of the teachers in the sample indicated that they had a computer (laptop) in their homes.

Another research questions were answered with the help of literature study and empirical research in schools (four primary and two secondary schools grade). It collected data on the participation, skills, and learning outcomes, attitude and approaches of pupils working with certain ICT applications.

FINDINGS AND DISCUSSION

As a first step in that analysis, descriptive statistics were performed for each of the variables of the questionnaire to determine. The one category of new items included the total frequency with which any type of software was used in the specific content area (e.g. how many times computers were being used in mathematics per week).

Table 1. Descriptive statistic of computer use in different content areas per week.

|	Minimum	Maximum	Mean
English (24)	0	6	3
Religion (32)	0	2	1
Science (23)	0	4	2
Counseling (28)	0	2	1
Mathematics (25)	0	4	2
Social (27)	0	4	2
Indonesian. L (27)	0	4	2

On average, English was the subject in which software programs were used the most, while Counseling was the subject in which software programs were used the least.

The literature points out that difference between pupils in knowledge and skills in the field of ICT, as well as differences knowledge and skills in other subject areas can be linked to the use of ICT in learning tool. We will look at both issues in more detail below.

The literature indicates that primary score less well than the secondary in tests that measure ICT knowledge and skills (Jansen Reinen & Plomp, 1997). Little is known about ethnic differences. Our research showed some differences in ICT skills, as reported by pupils themselves (see Graphs 1 and 2).
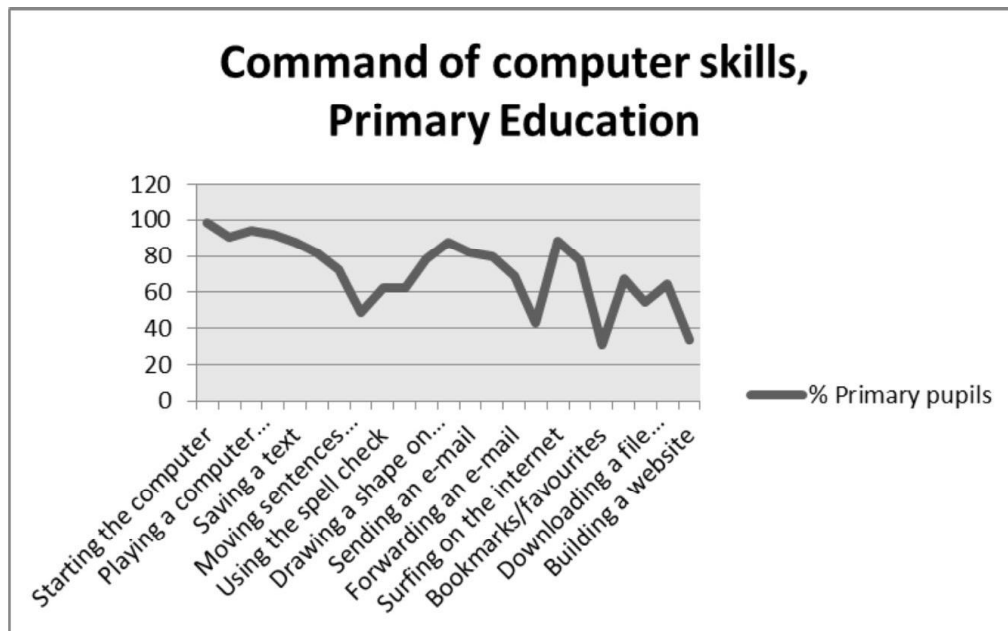
Graph 1. Command of computer skills, primary education.
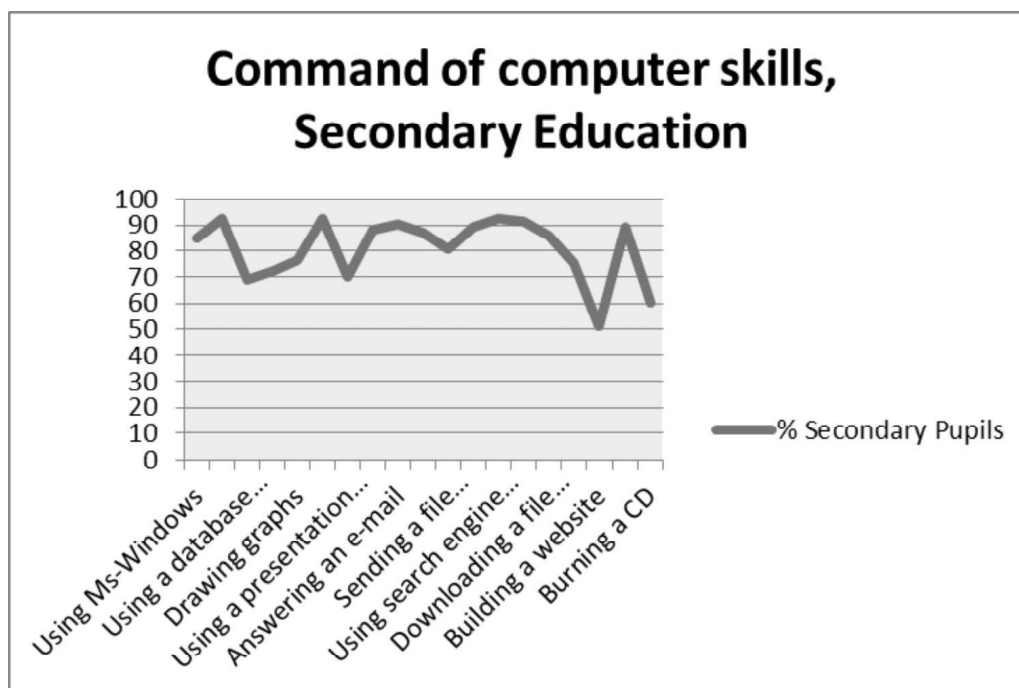
Graph 2.Command of computer skills,secondary education.

Primary school pupils consider themselves to competent in some skills. This particularly applied to word-processing skills (e.g., moving sentences in a text), working with illustration (e.g., inserting picture), and skills involved in using internet (e.g., using search engines). Secondary pupils consider themselves to have the following skills: use Ms-Windows, use a presentation program, e-mail skills, and bookmarking favorite.

ICT has become an integrated part of our daily lives, so it won't be long before it also becomes an inseparable part of students' and teachers' lives.

CONCLUSION

The result provided by qualitative analysis of the literature obtained will be exposed especially regarding those aspects which are related to ICT for education and ICT in education. ICT for education refers to the development of information and communications technology specifically for teaching learning purposes, while the ICT in education involves the adoption of general components of information and communication technologies in the teaching learning process.

Using ICT in education could also reach the goals as Wagner stated before;

1) Achieving basic education

   By the use of ICT can achieve universal primary basic education with a complete full course of primary schooling. There are so many education games for children. The alphabet games and numbers song for kids, are proofed that ICT can use to achieve the basic education.

2) Building the Education for All (EFA)

   The distance learning can be done in inadequate school by using of ICT. The ICT help the wide information is shared around the world. The educational opportunities like the lack

of education for disable also can be reached by ICT in education. For the example, the audio reading of some books for the deaf learner could help reach the education for all.

ICT is potentially powerful tool for extending educational opportunities, both formal and non-formal education. ICT can be put by everyone in everytime and everywhere. ICT be a possible leaning to the learner in time and space. It also access to remote learning resources about learning material for the educational need.

The potential impact in the use of ICT in education stated by Kozma also appear, such as;

- *Student outcomes* such as increased knowledge of school subjects, improved attitudes about learning, and the acquisition of new skills needed for a developing economy. Beyond learning outcomes, ICT may help close the gender gap, and help students with the special needs.
- *Teacher and classroom outcomes* such as development of teachers' technology skills and knowledge of new pedagogical approaches, as well as improved mastery of content and attitudes toward teaching.
- Other outcomes such as increased innovativeness in schools and increased access of community members to adult education and literacy.

ICT as an aid of education can potentially valuable knowledge commodity, for ICT can achieve the goals of education. This, however, provides small comfort for the author. The problem issues about number of lack factors of the implication such as a lack of funding to support the purchase of the ICT, a lack of training among teaching practitioners, a lack of motivation and need among teachers to adopt ICT as a teaching tools, are appeared.

To face those problems, when ICT is used in education, the actors or participants (learner, professor/teacher, and administration) should:

- Convince all people that there is no worry to pay more to have the better learning,
- Could have the ICT tools from the government,
- Give the ICT training to the teacher or practitioner, so it could motivate the teachers and believe the importance of ICT need.

This literature review has sought to explore the role of ICT in education as we progress into the 21st century. In particular ICT have impacted on educational practice in education to date in quite small ways but that the impact will grow considerably in years to come and that ICT will become a strong agent for change among many educational practices. Adopting these activities and practices, the continued use and development of ICT within education will have a strong impact on teaching and learning process.

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