

**ANALYSIS OF BARRIERS TO THE USE OF INFORMATION AND
COMMUNICATION TECHNOLOGY (ICT) IN LEARNING MATHEMATICS IN SMA
BATIK 2 SURAKARTA**

PUBLICATION ARTICLE

Research Paper

Submitted as a Partial Fulfillment of the Requirements
For Getting Bachelor Degree of Education
in Mathematics Department



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2014



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Program Studi : Pendidikan Matematika

Judul Skripsi : "ANALYSIS OF BARRIERS TO THE USE OF
INFORMATION AND COMMUNICATION TECHNOLOGY
(ICT) IN LEARNING MATHEMATICS IN SMA BATIK 2
SURAKARTA"

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ANALYSIS OF BARRIERS TO THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN LEARNING MATHEMATICS IN SMA BATIK 2 SURAKARTA

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ABSTRACT

This study aims to determine the barriers to the use of ICT in learning mathematics in SMA Batik 2 Surakarta. This type of research is qualitative research. The subjects were students of class X Science 1 & X Science 2, as well as mathematics teacher in SMA Batik 2 Surakarta. Data collection methods used include: questionnaires, interviews, observation, and documentation. validity of the data was tested by the triangulation technique. The data analysis technique used is data reduction, data display, and conclusion. The results of this study indicate that: (1) the availability of ICT in SMA Batik 2 Surakarta is adequate and in good condition, (2) the categories of ICT literacy of students and mathematics' teachers in SMA Batik 2 Surakarta is quite good, (3) the barriers of the use of ICT in the learning Mathematics are the allocation for the use of ICT in the learning mathematics is low, the categories of mathematics teachers' professional activities in SMA Batik 2 Surakarta is less, and the perception of mathematics' teacher about the integration of ICT in the learning mathematics is wrong. Based on these results, we can conclude that a good ICT literacy of students and teachers are not put to good use in teaching mathematics. Lack of awareness of teachers to integrate ICT into mathematics learning, making students see the eyes role of ICT in teaching mathematics.

Keywords: *ICT, ICT literacy*

INTRODUCTION

Mathematics is an abstract material which has different characteristics with other materials science (Arnawa, 2006) in Ibrahim and Suparni (2012: 35). Scopes (1973) in Russell (2004) states: "Mathematics is a higher-level intellectual

exercise, an art form and an example of the creativity of the human mind. Word like aesthetics and elegance are important to the purist. "

According to Anantta Sannai (2004) in Rusman (2011: 88), Information and Communications Technology (ICT) is a medium or tool in gaining knowledge between one person to another. Meanwhile, according to the Ministry of Research and Technology (2006:6) in Darmawan (2012: 1), Information and Communication Technology (ICT) as part of the science and technology (science and technology) in general is all the technology associated with the retrieval, collection, processing, storage, distribution, and presentation of information.

Nowadays, ICT in education is very popular. It has big role to speed up the development of education. The development of ICT will bring major changes in the world of education. This is in line with what is described by Tinio (2002: 7),

"ICTs can enhance the quality of education in several ways: by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training."

It proved that ICT can improve the quality of education. Through quality education, is expected to create quality human resources which are ready to face global challenges. The explanation above is supported by Tilaar (2012: 152) that quality education is the motto of globalization.

ICT especially in learning process is as media. And in the learning process, the role of media is very important, that is as a learning tool as well as learning resources. Without the media, knowledge transfer may not run smoothly. Arsyad (2003: 3), media word comes from the Latin medius, which literally means 'middle', 'intermediate', or 'introduction'. Gerlach & Ely (1971) in Arsyad (2003: 3) says that if the media is understood broadly human, material, or events that establish conditions that enable the pupils to acquire knowledge, skills, or attitudes.

Chaeruman (2005) states that there are several obstacles that needs to be underlined with regard to the use of ICT for learning. These constraints are:

1. refusal / reluctance to change (resistance to change), especially from policy makers (principals and teachers);
2. HR readiness (ICT literacy and competency of teachers);

3. availability of ICT facilities;
4. the availability of learning materials based on various sources;
5. (*sustainability*) because of limited funds.

In the context of learning mathematics, ICT has big role in advancing the quality of its learning. Murtiyasa (2006) concluded that the integration of ICT in education will enhance the quality of learning mathematics.

One of school that has been integrating ICT in learning is in SMA Batik 2 Surakarta. SMA Batik 2 Surakarta is one of school that has the facilities of ICT to run their curriculum. From the urgencies above, this research aims to find the barriers to the use of ICT in learning mathematics in SMA Batik 2 Surakarta.

RESEARCH METHOD

This research use qualitative method, which is describe about the phenomenon happened in the field.

This research take place in SMA Batik 2 Surakarta which is located in Sam Ratulangi Road No 86 Kerten, Surakarta. This research was conducted over 2 weeks from 2nd week on May until the last week in May. In this research, students of X Science 1 & 2, and mathematics' teacher in SMA Batik 2 Surakarta are the subject of this research.

Data collection techniques used in this research is questionnaire method, interview method, observation, and documentation. Data analysis techniques in this research using data collection, data presentation, and conclusion drawing.

Data validity will be checked by traingulation techniques. Triangulation is a data validity checking techniques which utilizing something else out of that data for checking purposes or as a comparison to the data. This research use the triangulation method by comparing the information or data obtained using interviews, observation, observation tests, and triangulation of data sources, the data checking test observations, observation result and documentation results.

RESULTS AND DISCUSSION

From the observation, we can see that the provisions of ICT in SMA Batik 2 Surakarta include the computer, LCD, projector, and Wifi. The division that needs ICT to support their duty is classroom, teachers' room, Head Master's room, students center room, students council room, library, IT center, laboratory of multimedia and computer. In each room, it has computer that assists the employee to finish their work. This is very helpful and important to them. The condition of computer is quite good. But, there are 3 rooms that don't have computer; class room, teacher's room, and students' council room. Overall, the condition of computer in SMA Batik 2 Surakarta is good. There is just one computer that is out of order in the students center room.

When there is computer, there should be LCD & projector as toolkit for presentation. Regrettably, LCD & projector are just available in each classroom. Because the division that needs LCD & projector is classroom and meeting room. Overall, the condition of LCD & projector in the classroom is good. There is just 1 or 2 class which its LCD is out of order.

SMA Batik 2 Surakarta provides 24 hours free hotspot Wifi as the internet connection. Everywhere as well as you in the area of SMA Batik 2 Surakarta, you can access it freely. This is one of the school policy to integrate ICT in education.

ICT literacy of students is divided into 4 elements, they are: (1) the ownership of computer, (2) duration to use the computer, (3) using computer program, (4) involvement of ICT in its working. The result is all students have their own computer. Some of them bring their computer to the school. They can spend 3 hours to use computer everyday. Students usually use internet in every time. They may spend their time to enter social media such as facebook, twitter, path, etc. They use computer or their mobile phone to access internet. In the discussion of learning mathematics, they still choose book as the highest place to learn and to calculate. Their opinion stated that ICT will be functioned if they can't find the material or the answer on their book or notes. When the students are working on their own learning, they always do it by employing book and other written sources. However, when they do not find solution from such sources, they

turn to another source, i.e. ICT. This shows us that the use of ICT has not been their first priority.

ICT literacy of mathematics teacher is divided into 5 elements. They are: (1) the ownership of computer, (2) duration to use the computer, (3) using computer program, (4) involvement of ICT in its working, and (5) participation in computer course. The result is mathematics teacher have their own computer, smartphone, e-mail, social media account, and internet connection. They can spend 4 hours to use computer. But they are sometimes use internet. They usually can use Microsoft Office to help their duty, such as Microsoft Word to write, Microsoft Excel to input students' mark, and Microsoft Power Point to presentation. Other evaluation shows that all of mathematics' teacher ever join computer course in their work office.

In line with ICT literacy, mathematics teacher also have their professional activities as teacher facilitated with ICT. They are writing, data processing, presenting, looking for information, and communicating. First, they have good category in writing, they write lesson plan and question using computer. Second, they use Microsoft Excel to process data; student mark. But in presenting, they are very rare to use ICT in the learning mathematics. They said that mathematics is theoretical, but ICT is practical. They pretending that learning mathematics can't be combined with ICT. Another case, they are rare to find information and material through internet to improve their performance in the class. The last, most of mathematics teacher don't have blog/website, but they have e-mail. They should use it to improve their skill in technology. But, they are never give material or assignment through e-mail and must be send by e-mail too.

Based on the observation, the portion of use ICT in learning mathematics is very rare. Mathematics' teachers still apply the conventional method to teach their students. The teachers don't accustom to themselves and their students to use ICT in learning mathematics.

From the result of research above, we know that the category of ICT literacy of students and mathematics' teacher is quite good. The good ICT literacy should give positive influence in the learning. In fact, the professional activities

of mathematics' teacher facilitated with ICT just on writing and processing data. For presentation, looking for information and communication is very rare. The mathematics' teacher should aware that ICT in the learning mathematics is very important because it can improve motivation and evaluation.

CONCLUSION

The providence and condition of ICT in SMA Batik 2 Surakarta is quite good. But, in each classroom, there is no computer to be used by the students or the teacher. Although each classroom has LCD and projector, but computer is also needed.

ICT literacy of students and mathematics teacher is good. The learning mathematics can't be run with the integration of ICT because of mathematics' teacher perceptions. They regarded that mathematics is theoretical, but ICT is practical. According to the study, it can't be accepted. Because in many studies/researches before, found that learning mathematics using ICT can improve the quality of learning and attract students to learn Mathematics. Consider to students, they have not yet seen the ICT as a paramount importance in the learning facility.

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