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Research Paper

Modern technology: Has it been utilized in learning?

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ABSTRACT

The purpose of writing this paper is to find out how far the modern technology, especially mobile technology that developed today is used by teachers in the process of learning in the classroom. This presents new challenges to teachers in their ability to collaborate optimally used technology and learning methods. This research uses descriptive methods with data collection techniques in the form of observation and interviews with relevant sources. The participants of the research are 12 teachers in four elementary schools in Bendosari. Despite in many studies, it is said that modern technology can have a positive impact on classroom learning, but the teacher's active role in using technology in the classroom depends on the availability of infrastructure and teacher awareness of the benefits of technology in learning. This paper shows that all teachers have and using smartphones, but few still use them in classroom learning. There are still many obstacles in the field to be some factors why teachers have not been able to take advantage of rapid technological development opportunities. The factors are age limitations, skills in technology operations in learning and the absence of obligations for teachers to use technology as a media of learning.

Keywords: *modern technology, instructional media, learning, education, mobile*

INTRODUCTION

Today, with continuous improvement of the level of modern science and technology,digital technology is growing rapidly (Wei & Yuan, 2018). Technology is now beginning to enter into various aspects of human life. One is the human need for information and communication. In recent years, information technology has made significant progress (Hamidi & Chavoshi, 2018).

Nowadays, technology and social networks form big part of human life from early childhood to elder ages (Kayimbasioglu, Oktekin, & Haci, 2016). Technology can now be easily found everywhere. Mobile device ownership has exploded with the majority of adults owning more than one mobile device (Crompton & Burke, 2018).

The ubiquity, flexibility, ease of access and diverse capabilities of mobile technologies make them valuable and a necessity in current times (Bano, Zowghi, Kearney, Shuck, & Aubusson, 2018). Internet access is increasingly widespread and fast becoming a complement in the utilization of technology. One of the trajectories in the development of ICT is represented by the Internet, which is one of the fundamental tools in everyday life (Castellacci & Tveito, 2018).

Users of smartphones and gadget technology in Indonesia in 2016 reached about 25% of the total 250 million people, the population of Indonesia, which is about 65 million people (Kemenristekdikti, 2017). With this acquisition, Indonesia ranked 4th largest smartphone user in the world after China, India and America. In fact, according to the Digital Marketing Research Institute, "Emarketer" estimates that by 2018, active smartphone users in Indonesia will reach more than 100 million people.

The use of computers as part of technology is also increasingly widespread and has penetrated the world of education. (Jaya, Haryoko, & Lu'mu, 2017). Today, computers are not just a tool for business or entertainment, but more than that. Access to information with the internet connection makes the computer has diverse usability. With the increasing coverage of mobile networks, learning services can play the increasing and effective role in education at any time and place (Hamidi & Chavoshi, 2018). This is an opportunity for teachers in using mobile technology in education.

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Smartphone users by teachers in Bendosari are as much as 100% of the total teachers who are the subject of research. That is, all teachers have smartphones. The use of social media applications to be one application that many teachers use every day in using a smartphone. The second most is browsing and the third is using email.

However, teacher activeness in the use of modern technology used in everyday activities is not directly proportional to its use for learning in the classroom. Teachers still have not seen the development of advanced and diverse technologies as potential to develop more interesting and interactive learning media. The accelerated development of techniques to implement alternatives to the traditional teaching methods (Asandului, Ceobanu, & Ionescu, 2009). Currently teachers are still using teaching methods lectures and the use of media images as a media of learning in the classroom. [...] technologies like microsoft office, videos, digital cameras and projectors are being used in private schools to improve the role of knowledge transfer (Waqar, 2013).

One of the main purposes of using modern technology such as smartphones, laptops and gadgets in classroom teachers' learning that is collaborated with the usual teacher learning methods, is to create a more engaging and interactive learning media. [...] as the development of communications technology that began to affect social life, communication technology can be utilized as an opportunity within the scope of education (Büyükbaykal, 2014). Students can be more active in learning activities and student centered learning will be more easily achieved. With the strategic use of computers, students can learn to locate their own resources, access content in flexible ways, and engage with a variety of information presented in multiple formats (Castek, 2012).

The literature review in this article is useful to observe the results of scientific work of some previous research on technology in education in the form of learning media and its use in learning in the classroom. Educational technology for those educators include any media that can be used (Lever-Duffy, Mc. Donnald, & Mizel, 2003). From the explanation, the media used in the learning is very broad. Furthermore, the book titled "Teaching and Learning with Technology" describes educational technology may include printed media, models, projected and non projected visuals, as well as audio, video and digital media (Lever-Duffy, Mc. Donnald, & Mizel, 2003).
According to research, point out that the use of the latest technology today, has far-reaching impacts on learning activities, not just improvements in educational methodologies, but also the diversity of existing technologies can be an opportunity for students in choosing technologies to be utilized accordingly with his needs (Abachi & Muhammad, 2014). This encourages opportunities for achievement of student learning outcomes to increase.

ANALYSIS OF THE ISSUE

Teachers and Modern Technologies

The rapid technological developments make people obtain information easier (Siwawetkul & Koraneekij, 2018). Smartphones, tablet computers, and wearable devices such as smartwatches are deeply transforming the way we engage with technology on daily basis (Ayeh, 2018). Mobile technology can also narrow the distance and time in communicating and seeking information. The existence of mobile technology, access to information can be done anytime and anywhere . With the rapid rise of smartphone usage in recent years, smartphone devices have become a ubiquitous part of our culture and revolutionized how we live (Hartanto & Yang, 2016).

Technologies such as smartphones, gadgets and laptops are not only used as a means of communication and seeking information only, but also useful as a tool to facilitate human work. Smaldino, in his book, says that the term technology is always interpreted with a variety of things, from hardware to how to solve problems (Smaldino, Russel, Heinich, & Molenda, 2005). Technology is created to help human beings in performing daily activities. It's included in the aspect of organizing educational activities in the class. Mobile technology is increasingly an element to be considered a paradigm that is changing in education in general, […] (Moreira, Pereira, Durão, & Ferreira, 2018). Technology used by teachers in the implementation of learning in the classroom can be one way teachers to improve the quality of learning.

Many varieties of technology makes teachers can explore freely in order to be applied in teaching and learning activities. With the onset of ubiquitous handheld technology, teachers are also exploring the opportunities to combine mobile devices with collaborative learning environments in order to enhance learning (Heflin, Shewmaker, & Nguyen, 2017). The use of mobile technology with wireless technology offers ease and convenience and can elevate educational achievement (Siwawetkul & Koraneekij, 2018). So that student learning outcomes can be understood optimally. Rapidly developing technologies facilitates new leisure activities, and time for obtaining information becomes smaller (Anikina & Yakimenko, 2015). Finding lesson material done by students can be easier and faster. With the advancements of Internet and smart mobile devices,

learning could be offered and conducted across geographical borders, time zones, and locations (Ooi, Hew, & Lee, 2018).

The development is not limited to technologies such as smartphones, laptops or gadget, but also internet access. It is a controversial phenomenon because it has changed social and economic life for the better (Berhatov, Campa, & Pletnev, 2018). Internet access is important because we can access limited information from the physical learning media, such as magazine books or newspapers. Internet access can also help us find information wherever in the world. Without any place and time restrictions.

The quality of teacher resources in mastering technology is needed in utilizing technology. With the purpose of meeting the generations of students born with digital technology (Generation X), it is necessary to make an adaptation of the teaching-learning processes, in order accommodate new technologies (Moreira, Pereira, Durão, & Ferreira, 2018). Furthermore, in teacher education programs, there is a need for prospective teachers to experience technology in various content areas and teach them with their clinical experience (Urbina & Polly, 2017). Teachers must be able to integrate technology into the learning that is done. The choice of technology should be in accordance with the content of the given lesson.

The activities of technology use by teachers in Bendosari are still dominated by information seeking activities, communication through social media and tasks beyond learning such as teacher administrative activities. Lack of teacher ability in mastering technology for learning becomes one of the main factors why technology is still rarely used in learning in the classroom. Facilities and infrastructure in the form of technology devoted to learning activities in schools are still not utilized by teachers optimally. [...] although sophisticated digital tools are available in classroom, they have been grossly underutilized by teachers who lack the proper skill of using new technologies effectively (Eakle, 2012).

Teacher educators play an important role in preparing student teachers to integrate technology into their classrooms (Uerz, Volman, & Kral, 2018). Without sufficient teacher and teacher support, it is unreasonable to expect technology to be integrated in the desired way even in one-on-one environments (Urbina & Polly, 2017). To mastering the use of technology and troubleshooting in the use of technology, teachers must have the ability to master the technology so that students can be interested and use technology as a tool in finding information and learning materials.

Teachers and modern technologies to create learning media

The current technology can be used by teachers as a tool for the delivery of class materials, called learning media. Smaldino, said that the word media which is a singular word of the plural, ie media, is a means of communication and a source of information. The word derived from Latin means "between", the term refers to something that carries information between source and receiver (Smaldino, Russel, Heinich, & Molenda, 2005). Media aims to connect between information sources (teachers) with learning (student).

Teachers must determine the appropriate learning media in learning. However, learning can be enhanced by the students' character and the priorities of the technology and its pedagogic design. Involved (Firmin & Genesi, 2013). Analytical results indicate that learning achievement, learning satisfaction, and learning retention of the MAMCM (Multimedia Animation and Multidimensional Concept Maps) group were better than those of the MCM (Multidimensional Concept Maps) group (Chiou, Tien, & Lee, 2014). Furthermore, Schachter (1999) [...] scores on the National Assessment of Education Progress (NAEP) were higher for the students of specific grades of technology (O'Bannon & Puckett, 2010).

Media has different variety formats. Such as TV broadcasts, video, printed media, charts, computer software, and instructors [...] the newer learning technologies include CD or DVD disks, communications using satellite and the Internet (Smaldino, Russel, Heinich, & Molenda, 2005). Between media formats with each other differ in terms of implementation in learning. Teachers must be capable to choose and create media that match the characteristics of students. (Smaldino, Russel, Heinich, & Molenda, 2005).

METHOD

This study used descriptive research methods. Descriptive research is a research conducted to explain or explain systematically, factually and accurately to the facts and nature of a matter population (Sanjaya, 2014).

This research was conducted in Bendosari involving 12 teachers from 4 schools. Data completion techniques use 2 ways. The technique data using observation data and calculation techniques using in-depth interviews with teachers. In conducting descriptive research, there are 10 steps performed. The 10 steps are 1) Identify the research problem; 2) formulate and limit the problem; 3) conducting literature study; 4) formulate hypotheses

(if required); 5) development of research instruments; 6) determine the subject of research; 7) collect data; 8) analyzing data; 9) discusses the results of the research and its conclusions; 10) prepare reports and publish them (Sanjaya, 2014). Participants in this study are shown in Table 1.

Table 1. Participants

No	School	Teacher
1	SD 1	GR 1
		GR 2
		GR 3
2	SD 2	GR 4
		GR 5
		GR 6
3	SD 3	GR 7
		GR 8
		GR 9
4	SD 4	GR 10
		GR 11
		GR 12

Each school used in this study involved 3 participants, namely elementary school teachers. The selection of participants was done by using purposive sampling technique. Purposive sampling is a technique of sampling the source data with certain considerations (Sugiyono, 2017).

Data collection is done by observation and interview to the participants. Observation in the form of collecting data about the availability of school facilities and infrastructure in supporting the utilization of technology in schools. Interviews were conducted by questioning the use of technology, both in daily life and in classroom learning practices. The researcher gave the question verbally, then answered by the participant, the teacher.

The first thing to examine is whether every teacher has modern technology as a tool in everyday life, what technology is used and how teachers utilize the technology. Given the vast development of technological applications, education cannot ignore the use of technology for teaching and learning (Heitink, Voogt, Verplanken, Fisser, & Braak, 2016). This is studied because the ownership of technology for teachers shows that teachers need the technology to help perform activities, both in communications and in activities business/work. To be more clearly, need to be studied also for what technology utilization did by the teacher.

Secondly, Will the teacher be able to utilize the technology into classroom learning and how many teachers utilize technology in the classroom. Technology is not only useful for communication and business activities but also useful in education. The use of mobile technology in education provides educators with the opportunity to reimagine teaching and learning (Heflin, Shewmaker, & Nguyen, 2017). The use of technology in education needs to collaborate with methods and characteristics of students and subject matter that exist. So that later learning by using technology to be optimal.

Constraints faced in the use of technology in the classroom and efforts made in solving the problem. Technology is present without problems. Various technologies are evolving today, it takes expertise and skills in utilizing these technologies to optimum. It's necessary to examine what problems arise in the efforts of teachers to use technology to be applied in the classroom. In addition, there is a need for advice from the teacher about how the right solution to solving the problems encountered.

FINDINGS AND DISCUSSION

This research explores the information shown in Table 2.

Table 2. Instruments excavated in the interview

No	Aspect
1	Ownership of modern technology
2	Use of modern technology in classroom learning
3	Constraints and problems encountered in using technology in the classroom
4	Suggestions for stakeholders in solving the problems faced in utilizing modern technology in the classroom

Information on teacher use and ownership of modern technology is important because it can tell if teachers have known and used the technology in their daily activities. In addition, it needs to be studied further whether the teacher knows and has utilized the technology in the learning activities in the classroom. The focus in extracting information is on the implementation of technology in learning in the classroom.

A total of 12 elementary teachers in Sukoharjo have smartphones and laptops. This indicates that the teacher has a modern technology, both used to communicate and do administrative activities in the School.

> *"I used to use android smartphone more often for communication with friends in school teachers. Sometimes also communication with the teacher community group. Sometimes email is used to send*

documents or photos about teacher administration and more. But that is often used through chat applications because it is easier and the number has been stored in the phone. "(GR 1).

"Sometimes also often looking for materials or digital books for teaching materials in the classroom. Often also watch video learning via mobile phone. Easier and more complete. "(GR 2).

Generally, teachers use technology such as smartphones. Android-based mostly for communication through social media and chatting, then browsing to find information about learning materials that will be taught, and sometimes send email in the form of documents related to teacher administration.

Smartphone use is mostly used by teachers because smartphones can be used for various activities. Mobile technology has led to most people to carry their own individual small computers that contain exceptional computing power, such as laptops, personal digital assistants (PDAs), tablet personal computers (PCs), cell phones, and e-book readers (Sung, Chang, & Liu, 2016). Communication is the main thing in smartphone usage activity. Teachers often communicate with co-workers or family.

The more rapid the development of technology, the teacher has many options in utilizing technology for learning in the classroom. Mobile devices such as laptops, personal digital assistants, and mobile phones have become a learning tool with great potential in both classrooms and outdoor learning (Sung, Chang, & Liu, 2016). Master plays an important role in applying technology to its class (Uerz, Volman, & Kral, 2018). Utilization of technology provides a different and interesting learning alternative.

"Usually I use a laptop. Search for images or illustrations about the material of a process or object. Sometimes I give materials using power point. "(GR 4).

"In the School to use the presentation media students must go to the computer laboratory, because it is installed there. So the presentation is using a computer. For the contents of the presentation is simple and not many animations are displayed. Most of the writing and pictures are supportive." (GR 6).

"There is a video I downloaded on the internet. Usually material about plant growth process, etc. Then I show it in class. So I can see if students are concentrated or not. "(GR 9).

Based on interviews about the use of technology in learning, teachers generally use the media presentation power point as a media presentation application in the classroom. Presentation media presented contains writings and pictures taken from the internet. Then there is a video downloaded from the internet. Usually the material is related to the process.

In using technology in the classroom, the selection of appropriate media in explaining the material is important. Need a proper plan for utilizing the technology to be optimal. In secondary schooling, a key aspect of this is concerned with understanding how digital technologies are used to support teaching and learning in specific subject areas (Howard, Chan, Mozejko, & Caputi, 2015). Currently, teachers who use technology in the classroom are able to choose what the media is to be taught.

Utilization of technology in learning is still limited. Teachers have not created interactive and animated media.

"I make a presentation at home, If there is material that students are usually not concentrated, prefer to do their own activities, I make a presentation. Presentations I make by asking the experts, sometimes the same friends who are more familiar teachers or family at home. I do not know how to make a good presentation. "(GR 6)

"Based on my experience in lecture presentations, sometimes helped by children, I create media presentations in the classroom. It was not taught how to make presentations. Sometimes the results are too large. Different colors between in laptop with on projector. So sometimes the wrong color in the writing becomes unreadable by the students. "(GR 4)

Teachers who use the learning media are on average still young, it's under 30 years. The teachers are self-taught, either learning to the more expert or family. So the teacher can make and operate the media.

Constraints faced when making the learning media is the lack of knowledge in making the media presentation. Master still has not mastered how to create a good and correct media. So that the media products produced with the presentation software sometimes too much writing or colors are less clearly seen on the screen projector. This is a concern because, with the teacher's awareness of the benefits of technology in education, teachers choose to learn self-taught in order to take advantage of technology in the process of learning in the classroom.

" When showing video downloaded videos in the classroom, students become interested in learning and concentrated. Rarely do students do their own activities. "(GR 9)

"There is a difference when only using lecture methods and learning media. Students are more happy and active listening to material with the media. "(GR 12)

"Using learning media makes it easy to explain the material in the classroom. There are videos and images able to explain the material that the students can not understand. (GR 6)

Based on the experience of teachers who use laptop and LCD Projectors as a presentation media, student interaction and activities in the classroom can be more controlled than without using presentations. Students are more focused and interested in the given impressions. Materials that students cannot understand can be delivered with the help of relevant videos or images. In addition, facilitate teachers in explaining things that are difficult to understand students.

The success of technology integration is also dependent on the perspective of the teacher (Pate, 2016). The use of technology in accordance with the characteristics of students and subject matter will provide optimal benefits. The integration of technology into learning in the classroom needs a mature plan so that technology is expected to be a teacher aids in explaining the class in the classroom.

However, not all teachers apply technology in classroom learning. The application of technology that has a positive impact on students has not been able to make teachers actively utilize the technology. Although in terms of facilities and infrastructure is adequate, but still not utilized optimally.

"Since the first time, I only use simple media, such as drawings and textbooks only. To use the laptop, I still feel confused to use because it is not used and never taught using a laptop. "(GR 3)

"I'm used to using lecture methods. To use the laptop still has not mastered well. I have attended a training using a presentation application, but sometime after the training, when trying to operate on my own, I forgot how the steps. Because I am old age does not learn again. "(GR 5).

"The age factor and preoccupation of taking care of the teacher administration, as well as the busyness of home activities, make time to learn the technology used in learning does not exist." (GR 7)

"In the absence of rules on the necessity of using modern technology in learning, then in using technology in the classroom is still limited and less desirable for having to learn first." (GR 11)

There are some obstacles in the limitations of teachers in operating the laptop, namely: (1) Age factor, teachers aged over 47 years is still less in operating the laptop. This is because the teacher is not accustomed from the beginning to use the laptop. So that at an old age, teachers have started lazy and less eager to learn it; (2) Teachers are not equipped with skills to master computer/laptop after college. (3) There is no claim to utilize computers/laptops / other technologies used to assist teachers in teaching in the classroom.

This makes teachers prefer to be in a "safe zone" where they prefer lectures and printed or self-drawing media. In fact, the School has provided adequate facilities and infrastructure to create media presentations, such as School laptops and LCD Projectors. But until now has not been utilized optimally because of the limited skills of teachers.

"There needs to be an active role of government in providing training on the use of modern technology in the classroom. Provide mentoring after training is done until the teacher is able to master the technology so that later can be utilized in learning. "(GR 4)

"It needs to be given the skills of mastering the technology in the form of presentation media for students who take the education department so that after they graduate have been able to make learning media from modern technology." (GR 6)

Required training for teachers in mastering modern technology that can be used as a tool for teachers to deliver learning materials in the classroom. Teachers play a key role in this transformation process; their beliefs, pedagogical practices, and teaching skills are continuously challenged (Assar, 2015). Need the role of the government concerned in developing the skills of teachers in efforts to bring the technology in the classroom. With the skills development training provided to the teachers, the expertise in combining the existing learning methods and technology will be optimal and the learning objectives are expected to be achieved. […] increasing knowledge and technological progress of society; our country requires learning skills that could help it keep pace with the development of science and technology (Hamidi, Meshkat, Rezaee, & Jafari, 2011).

CONCLUSSION AND LIMITATIONS

Conclusion

Modern technology is considered necessary to be implemented into classroom learning. Technology of Information and Communication play a very important role in the education sector, they can improve the knowledge of the student and at the same time the teaching methods used by teachers (Cieza & Lujan, 2018). The purpose of this study is to find out how much the use of modern technology by teachers. In addition, problems that arise in the use of technology in the class become the main concern.

Existing problems can be a solution in utilizing technology in the classroom. Teachers are required to be able to follow the development of technology and information by mastering the existing modern technology. An increasingly technology-rich society requires that, in addition to the more traditional literacies of reading, writing and mathematics, individuals acquire a new set of skills related to the use of Information and communication technologies (ICT) or digital technologies (Claro, et al., 2018). Technology could significantly aid in the efficacy of instruction if used properly (Pate, 2016).

To be used as a lever for pedagogical innovation and institutional transformation, teacher ICT competencies need to go beyond skills in ICT use, and enclose contextual knowledge about technology, pedagogy, and content (Assar, 2015). The role of teachers in the proper use of technology in this regard. One way to make it happen is to master the skills of using technology, both in terms of running and troubleshooting when used in the classroom. All teachers have and using smartphones, but few still use them in classroom learning. Utilization of modern technology will be optimal if combined with learning methods that can enable student interaction in the classroom.

The role of government is to organize and assist teachers in computer training programs so that teachers master learning media software that will produce good learning media products. Selection of learning media and learning methods that match the characteristics of students will give a better impact. The many studies that have been accomplished indicate that augmented by computer-based educational technology (Poole, 1997).

Limitations

Although in many studies, it is said that modern technology can have a positive impact on classroom learning activities, but the teacher's active role in using technology in the classroom depends on the availability of infrastructure and teacher awareness of the benefits of technology in learning.

Firstly, infrastructure covering facilities and infrastructure supporting the utilization of technology in the classroom must be fulfilled by the School. Equipment includes a package of presentation tools in the classroom (LCD Projector, Sound) has been available in the classroom/school. So that the equipment available can provide motivation for teachers to be able to take advantage of these facilities and infrastructure.

Second, teacher awareness of the benefits of technology that can be applied in the classroom must be formed. Teachers who are aware of the benefits of technology in achieving learning activities, able to collaborate technology, methods and learning materials well.

More specific research in the future should focus on how much teachers' awareness in mastering classroom learning technologies and how important the completeness of facilities and infrastructure supports the use of technology in the classroom.

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