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Utilization of Information and Communication Technology for Thematic Learning in Elementary Schools

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Abstract: The revolution of industry 4.0 has begun to have an impact on the world of education. Learning must be based on the use of ICT (Information and Communication Technology). ICT-based learning media is more interesting than conventional media. In fact, this has not been fully done. This research aimed to find out how far the use of ICT for learning has been implemented by teachers in elementary schools and the impact on students. The research method used is qualitative. The research subjects were teachers and students from 5 elementary schools in Wonogiri Regency. The data were collected using observations, questionnaires and interviews. It was found that ICT-based learning media with the application of an interactive crossword puzzle has benefits including; it can be used as a media or source of learning and the utilization in schools depends on the facilities they have and the motivation of the teacher to use it. The students' involvement in learning to use ICT makes them become passionate about learning. ICT, which is a facility in schools, can be used as a stimulus for teachers to use it in learning. Therefore, we need an understanding for teachers as learning agents to utilize ICT so that they can do thematic learning in elementary schools with maximum results.

Keywords: *ICT, thematic learning, elementary school*

INTRODUCTION

Learning develops along with the progress of the times. Learning following the times will experience an increase in both quality and quantity. One characteristic of learning that follows the times is learning that uses ICT (Information and Communication Technology) media. The development of science and technology is very fast, so if we as users do not have the desire to keep up with it, we will be left behind. Mastery of ICT is essential in the current era of globalization. One form of implementation is the ability to use computers to access the internet, process, and provide information that can be done individually or in groups. The use of ICT in learning is in accordance with Hong's opinion (2016: 33) which states that ICT implemented in education provides opportunities for students to learn independently in accordance with their times.

The revolution of industry 4.0, according to Kagermann *et al.* (2011), was officially born in Germany, precisely when the Hannover Fair was held in 2011. It indirectly influences all aspects of life including education. Heng (2013) also stated that the revolution of industry 4.0, born in Germany, aimed at making the country a leading manufacturer. Various terms of the revolution of industry include Smart Factories, Industrial Internet of Things, Smart Industry, or Advanced Manufacturing. The various terms used have the same purpose, namely, to improve the competitiveness of the industries of each country in facing a dynamic and expanding global market with the use of digital technology in various fields. Regarding the development of the world of education in line with the revolution of industry 4.0, education requires the support of technology so that learning goes hand in hand with the development that is the centre of attention in the world. One step in education is the use of ICT in learning. Various kinds of ICT that can be used are the internet, computers, LCDs, communication devices and so on. ICT

implementation in learning must be supported by a curriculum that has authority in implementing the learning process.

Suyadi and Dahlia (2014: 3) stated about the curriculum that basically functions in carrying out the learning process. Kurinasih and Sani (2014: 10) stated that the curriculum is a set of plans used as a guideline for implementing learning. Wall & Leckie (2017) argued that the curriculum covers what happens in schools including academics, arts, extracurricular activities, services, and supporting programs. The curriculum is prepared for students to provide new experiences that can be developed along with their development as a provision for their lives. The current curriculum is the 2013 curriculum with thematic learning. An integrative thematic approach is one form or integrated learning model, namely the webbed model which emphasizes the pattern of organizing materials integrated with the theme (Kurniawan, 2014: 95). The model integrated in the theme also exists in the 2013 curriculum which integrates several materials into one theme in one learning. Learning that integrates one material with another into one theme or sub-theme is also called thematic learning.

The implementation of the 2013 curriculum using a scientific approach requires learning media that can assist teachers in delivering materials to students as Sanjaya said (2014: 61) that learning media are all things like tools, from the environment and all forms of activities, that are conditioned to increase knowledge, change attitudes or add skills to everyone who uses them. Activities in the learning process will increase if the process is also supported by the media that helps students understand. As Uzun said (2018: 35) that the use of ICT is not only to develop practical skills in its use, but also to encourage students to have awareness of basic skills and knowledge about their use so as not to endanger themselves and others. The implementation of ICT media considers not only practical skills but also the media maintenance skills themselves to be maintained and used for the future.

ICT is the buffer of all technical equipment to process and deliver information with technology, as stated by Hartoyo (2010: 4) about ICT which can be interpreted as technology that functions or can be used to support communication or information delivery. Hartoyo (2010: 8) and Eylis, A (2018: 111) put forward the definition of ICT as a way, media, or technology for storing, restoring, manipulating, forwarding and receiving digital data or information. In short, ICT is used to convey information from the sender to the recipient of information with technology. In connection with this statement, ICT is used as a source and provider of thematic learning media in elementary schools.

Thematic learning, according to Prastowo (2013: 125S defined as integrated learning that uses themes to associate several subjects to provide meaningful learning experiences to students. Thematic learning is an approach to integrating knowledge, skills, values of learning and creative thinking using themes (Wuryani & Yamtinah, 2018). The teacher must encourage students to actively participate in learning. Students are given the opportunity to explore and experience the independent learning process. Thematic learning process helps students think creatively. Thematic learning is also a meaningful learning process and has multi-curriculum insight, namely meaningful learning and mastery of teaching material that is more meaningful to their lives with the development of mature thinking skills and behaviour so that they can be independent in solving problems in daily life.

Thematic learning will be more meaningful if supported using media. Media can be used to support thematic learning, related to the statement that the role of technology is very important in learning. This corresponds with (Winarni, Purwandari, Lusa, & Dadi, 2018) the statement that learning media is a tool for teachers to simplify and accelerate the learning process by systematically presenting information in accordance with the students' abilities and time

allocation. This is as stated by Arsyad (2014: 31) that the media in learning are grouped into four, namely: 1) media resulting from printing technology; 2) media resulting from audio-visual technology; 3) media resulting from computer technology; and 4) media resulting from the integration of printing and computer technology. The technology used in learning can be said as computer media and printed media because the results of printed media are from computer technology. Thus, ICT media is a media generated from computers and computer-assisted tools used in learning by integrating various subjects into one theme, namely thematic learning.

Kustandi and Sutjipto (2011: 9) mentioned about learning media that given the huge amount of learning media, it should be noted, the teacher must be able to choose carefully, so that it can be used properly. The media should be in line with the times and the development of students, namely technology-based media. Technology-based media is also often referred to as ICT. Thus, the 2013 curriculum or thematic learning that follows the progress of times such as the revolution of industry 4.0 is thematic learning integrated with ICT media. One example of the use of ICT in learning is the use of the Interactive Crossword Puzzle application.

Based on the explanation above, this research is essential to find out the benefits obtained from the use of ICT in thematic learning in elementary schools. This research can also describe the impact obtained by students and teachers with the use of ICT integrated in learning in elementary schools. The use of ICT that has been carried out can also Improve the quality of education.

METHOD

This research applied descriptive qualitative research method to describe situations or events relevant to the actual event, namely the event in the research location. The research design used was descriptive survey. This research aimed to describe a situation or facts that occurred in a population or in a specific field. Thus, the design of this research is to describe it by taking samples from the population as the research subject based on the data from the research subjects related to the use of ICT-based media in thematic learning in elementary schools as the object of research, with a sample of the fourth-grade teachers in 5 elementary schools in Wonogiri Regency. This research was conducted during the 2018/2019 academic year.

The results of the data collection through observation, interviews, and questionnaires were then rewritten and presented according to the data found. Then the data were selected and adjusted to the focus of the discussion in the research. After going through the analysis process in the framework of obtaining the correct data with in-depth tracking, the conclusion was drawn.

RESULTS AND DISCUSSION

This research used the data from interviews, observations, questionnaires and literature review. The interview results conducted by the researcher related to the use of ICT in thematic learning in five elementary schools in Wonogiri Regency included the understanding of teachers regarding thematic learning using ICT media on average stating that the learning delivered was good. The students not only knew the theory but also could apply it in everyday life. If thematic learning is well implemented, the results will also be good. This is consistent with research of (Stoian, 2016) that states that children are offered a series of themes that suit their interests and skills. Thematic curricula look at children's development and consider about learning. Students who are ready to learn will be able to receive the material with various media and models that will be used.

The results of the observation and questionnaire obtained from 5 elementary schools in Wonogiri Regency regarding the benefits of ICT media in the form of Laptops, LCDs, and Interactive applications can be described as follows:

1. **Benefits as a Media or Learning Resource**
   a. ICT-based media can facilitate and accelerate students' works (streamlining) and understanding of learning delivered by the teacher. ICT media in the form of an interactive crossword application is an application that can attract students' attention. Their curiosity increases because the answers to crosswords are not easy. They must really master the material to be able to fill in the answers to the application to continue to the next learning.
   b. It provides new experiences to students. Experiences that have never been obtained before will be a provision for the student in the next learning, so they will be able to learn more actively in order to solve the next problems in the crossword puzzle application.
   c. It facilitates student works as in the actual project. ICT has various forms of work that students can do, such as exploring, recording, approaching, counting and processing data, analysing sentences and evaluating learning.
   d. It facilitates Interaction in exchanging ideas between students and between students and teachers. Thus, the use of ICT media in form of the interactive crossword puzzle application can foster interaction, communication and exchange of thoughts in giving opinions. The interaction in question can also be explained that communication or interaction in exchanging ideas between students and students as well as teachers and students.
2. **Benefits as Teacher Motivation**
   a. ICT-based media can build a conducive school culture which begins by arousing and affirming the enthusiasm and motivation of all school members to carry out updates.
   b. The use of media can also foster the teacher's enthusiasm in teaching because of the use of uncommon media, so that the teacher's curiosity to apply and the ICT media used can increase students' understanding. Thus, it will help the teacher to provide the material to be taught.
   c. The atmosphere is different from usual because the media used is different from the media in general. The application of interactive crossword puzzles is rare, so this different atmosphere fosters new enthusiasm in learning and students' enthusiasm in learning.
3. **Benefits in Student Engagement**
   a. Students feel happy to use ICT media based on the interactive crossword puzzle application because students or children naturally like things that are coloured, pictured, sounded, moving or video and instant. Thus, they feel interested and happy with the learning that uses an interactive crossword application.
   b. Learning becomes so fun that the classroom conditions are controlled and directed according to what the teacher wants. Students' interest with ICT media gives a positive response to class conditions because starting from the beginning students who usually make noise or hyperactive students can be conditioned to be calm and try to be able to complete the task given.

c. ICT-based media can foster positive emotions in the learning process. Thus, students want to study well and can master the material provided so that the evaluation given has increased.

4. Benefits in School Facilities

a. Utilization in schools depends on the existing facilities so that the media owned by the school can influence the learning provided. The more complete the ICT media that the school has, the easier it will be for the teacher to do the learning according to the goals to be achieved.

b. The ICT-based media can improve the quality of schools. School facilities are the ingredients needed in the implementation of learning, even beyond the lessons. Thus, the complete facilities can result in outstanding students. The student achievement can have a good impact on the school's name so that it improves the quality of the school and increases the new students' learning interest in the school.

c. The facilities provided by the school to students for use in learning can make them more enthusiastic so that learning becomes quality which will later bring benefits for students and school.

The elaboration of the discussion in this research regarding the use of ICT in thematic learning is strengthened by relevant research. ICT media in learning is a medium that is used to help students learn so that learning objectives are achieved. In integrating technology into the learning process, experts examine and develop various models. The model proposed by Woodbridge (2019) was further modified and developed by the author. Some important notes from the model are as follows: 1) ICT plays a role in three functions: first, creating pleasant and exciting learning conditions (emotional effects); 2) providing students with skills to use high technology, which answers the challenges of its relevance to the world outside of school; and 3) a learning tool with application programs and utilities, which, in addition to simplifying and accelerating work, also multiply variations and techniques of analysis and interpretation. Thus, the three benefits of ICT technology in learning can cover the entire scope of learning which consists of opening to learning assessment.

The learning step by utilizing ICT on the use of interactive crosswords application can be described as follows: 1) First, students learn the instruction for using the media; 2) After they understand, students can open the interactive crosswords app on their laptops; 3) Students can reads the instruction that available in the application; 4) Students must learn the thematic learning material first, if they want to do on the crosswords puzzle; 5) Students doing the crosswords tasks. Images of crosswords puzzles on learning 1 can be seen as follows:

Picture 1. ICT-based interactive crosswords.

The next benefit regarding emotional information related to the application of ICT media in learning is also reinforced by Gunawan (2012) by quoting the findings of experts regarding the relationship between brain waves and emotions with the process of absorbing information. It was found that the frequency of brain waves varies in every condition, for example when sleeping, half asleep, relaxing, being serious and tense. The learning process using ICT media based on the interactive crossword puzzle application is ideal and very conducive in bringing each student to mastery of academic abilities. The utilization of ICT in learning process supports education that centered on students skills. (Smerci & Aydin, 2018). Therefore, the learning process with the media needs to be carried out continuously and gradually so that students feel new experiences every day and get proper learning.

The Interactive Crossword Puzzle application utilizes ICT as a learning resource and delivery medium. The Crossword Puzzle application used contains learning material in elementary schools, especially for the fourth grade. Crossword Puzzle in the form of the game application can sharpen students' brains. The Crossword Puzzle application can help students improve memory, encourage to explore and generate positive curiosity. This corresponds with the research of Soni, Aggarwal, and Gupta (2016: 118), which states that Crossword Puzzle stimulates the mind so that the brain can work pleasantly, and it can be an independent learning tool. Based on the research of Elson, Ostapski, O'Callaghan, & Walker (2012), Crossword Puzzle can train students' independence to achieve success. They will try to read textbooks enthusiastically in order to solve every question presented in the Crossword Puzzle game.

The learning process can be more effective when using ICT. The students' positive attitude grows so that their motivation for learning also increases. The use of ICT in learning is more interesting and fun. ICT makes students have a better understanding of how technology affects their lives. The teachers also believes that the use of ICT can improve their performance in teaching and help them learn new skills. (Safriyanti, 2019). This agrees with (Yamamoto, Yukiko, 2019) that ICT plays an important role in delivering quality education.

Based on a research (Nur & Madziatul, 2016) it is stated that the use of computer-based media can optimize students' brain activity during learning. This research also shows that learning using instructional aids will provide direct experience for students. Based on the research of (Arulselvi, 2011), the use of computer-based media makes a valuable contribution to learning carried out by students. Teachers as ICT media users must also have confidence in their implementation. This is as stated by Ertmer *et al.* (2012) and Shengru Li (2018: 106) in Aydin Aslan (2016: 360) that teachers' beliefs and attitudes towards the use of technology will have a positive effect on their knowledge and skills. Obstacles in the use of technology are also influenced by their beliefs. If you the teacher believes in the implementation, it is easy to use. If he doesn't believe, it will be an obstacle in its implementation.

CONCLUSIONS

From the results of the discussion above, conclusions can be drawn from this research regarding the use of ICT or Information and Communication Technology for thematic learning in elementary schools. The conclusions can be described as follows: The use of ICT for thematic learning in elementary schools covers five elementary schools in Wonogiri Regency. The ICT-based learning media used is the interactive crossword puzzle application supported with other ICT equipment such as computers and LCDs. The benefit of the use of interactive crossword puzzle application media created and utilized based on ICT for thematic learning in five elementary schools in Wonogiri Regency is that it can be used as a media or learning

resource that makes it easier for teachers to deliver learning messages so that students easily receive the material. School facilities are also an important factor in ICT utilization, in addition to the teacher's motivation of use ICT-based media. The students' involvement in learning to use ICT makes them become enthusiastic in following learning activities. The completeness of ICT as a facility in schools is also one of the stimuli for teachers to use the media in learning. The demands of the times have demanded that teachers continue to learn and improve learning by using media according to current conditions. Teachers' perceptions and motivations are two determinants of success in integrating ICT into learning.

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