

Influence of ICT Media and Critical Thinking Ability to the Ability of Literacy Science Literacy Students Elementary School

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Abstract

This study aims to find the influence of ICT media and the ability to think critically about science literacy skills of elementary school students. This research was conducted in class V SDN Kebon Kacang 01 Jakarta. The research design used experimental method with treatment by level 2 x 2. Data analysis was carried out using 2-way variance analysis (ANOVA). The results of this study are (1) the existence of different literacy skills of students who learn to use ICT Flash media with ICT Power Point Media. (2) There is an interaction between ICT media and critical thinking ability to science literacy ability of elementary school students. (3) Science literacy ability of students who have high critical thinking ability using ICT Flash media is higher than students having high critical thinking ability using ICT Power Point Media. (4) science literacy ability of students with low critical thinking ability using ICT Flash media is lower than students having low critical thinking ability using ICT Power Point Media.

Keywords: Media ICT, Flash, Power Point, critical thinking ability, the ability to science literacy.

Introduction

In the life of modern society, science is seen as the science of the present which includes knowledge of arithmetic and geometry. The learning process of Science should emphasize providing direct experience to develop competencies to explore and understand the natural world scientifically. Therefore, scientific literacy becomes a must for every student. To be able to learn and master the science required a teaching in order to get the right results and direction is clear that in accordance with the correct reasoning, implementation of active, creative and meaningful learning, the work that can be done is with the use of instructional media. Whether realized or not, the use of instructional media is very important in the learning process. Teachers are not the only source of learning, therefore teachers should be able to plan and create other learning resources. Efforts that can be made to make students have a good understanding of science literacy is to use ICT media.

The result of TIMSS study in science in 2015 Indonesia is ranked 45th with 48 countries followed, showing average science achievement score of 397 which decreased from the year 2011. Science achievement of Indonesian students below the average that is, 500 can only reached Low International Benchmark. Whereas the parents of Indonesian students reported that only 20% of

students are there who do not have the ability to read and count when entering elementary (capital at the beginning of good schooling). This shows that the readiness of Indonesian students is good enough. But when grade 4 was tested with TIMSS, 50% of students were still below Low and 30% at Low. Based on this data, it is clear that the ability of science in Indonesia is still far from expectations. Mastery of science is only limited to material mapping and has not been able to relate it to a variety of more complex or abstract science topics. McEneaney & Roberts (2008) explains that scientific literacy (SL) is one of the major elements in national educational systems worldwide. This means that science literacy is one of the main elements in the national education system around the world.

One way that is used to develop science literacy is to attract students' involvement in learning, teachers can create a fun learning atmosphere, can make students ready to learn and better and have an understanding of science then teachers can use ICT (Information Communication and Technology). ICT media can provide a stimulus to convey messages in learning, such as human interaction; reality, moving or not images and written and recorded sounds. According to Husain and Saehana (2015) Husain and Saehana said that ICT media is a tool that can help teachers in delivering messages / information and transfer knowledge to students. Learning that is packaged in such a way makes the learning process more enjoyable. The use of ICT-based media has

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implications for students' motivation in learning as well as to improve learning outcomes.

Another factor that affects the ability of science literacy is the ability to think critically (Critical Thinking). According to Harlinda in Dennis (2014), critical thinking is reasoned and reflective thinking with an emphasis on making decisions about what to believe or do.

Relevant research has been done by Monalisa gherardini (2016) entitled Influence of Learning Method and ability to think critically about ability of science literacy. From the research results show (1). The ability of science literacy between groups of students taught using Creative Problem Solving method is higher than the group of students taught using problem posing method (2) there is interaction effect between the learning method with the ability of critical thinking to the ability of science literacy. (3) the ability of science literacy among students with high critical thinking ability given by Creative Problem Solving method is higher than that of students with high critical ability given problem posing method (4) ability of science literacy among students with low critical thinking ability given method Creative Problem Solving is lower than that of students with low critical ability given problem posing method.

Based on the above problems, the researcher is interested to do research on Influence of ICT Media and Critical Thinking Ability to Student Science Literacy Ability. Thus this study can prove the truth of a theory and the phenomenon that exists.

Data Analysis

Based on calculations that have been done manually using ANAVA two paths obtained such an analysis. In the following table:

Table 1 ANAVA Interaction Result Between ICT Media and Student's Critical Thinking Ability to Student Science Literacy Ability

Source of variance	db	JK	RJK	F _{count}	F _{table}
Between Columns	1	42.025	42.025	9.45	4.11
Between Rows	1	27.225	27.225	6.12	4.11
Interaction	1	126.025	126.03	28.34	4.11
Inside	36	160.1	4.4472		
Total Reduced	39	355.375			

Test results in all four groups using Kolmogorov Liliefors test with significance level $\alpha = 0,05$ can be presented as follows:

a. Comparison of Science Literacy Ability Between ICT Flash Media (A1) With ICT Power Point Media (A2)

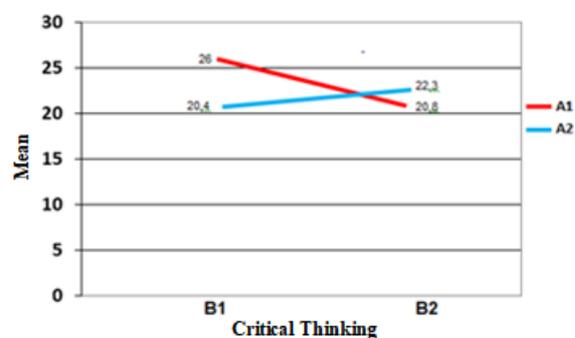
The result of Variant Analysis (ANAVA), obtained Fcount = 9.45 on Ftable (0.05) = 4.11, then H0 is rejected. Thus, there are differences in students' science literacy skills using ICT Flash (A1) media with ICT Power point (A2)

media. The average score of the group of students using ICT Flash media (A1) is $XA1 = 23.4$ with the group of students using ICT Power point (A2) media is $XA2 = 21.35$. Thus, it can be concluded that the ability of students' science literacy learned through ICT Flash media is higher than students who are taught through ICT Power point media.

b. The Influence of Interaction Between ICT Media and Student Critical Thinking Ability Of Student Science Literacy Ability.

Result of Variant Analysis (ANAVA), obtained Fhitung = 28,34 at Ftable (0,05) = 4,11, then H0 is rejected. Thus, there is a very significant interaction effect between the ICT media and the ability to think critically on the students' science literacy skills.

After knowing the interaction between ICT media and students' critical thinking ability, further test is needed, further test used is Tukey test. With Tukey test can be stated that the influence of interaction between the provision of ICT media and the ability to think critically. This can be seen from the picture below:



Picture 1 Graph of Interaction between ICT Media and Critical Thinking Ability to Science Literacy Ability

Description

- A1 = ICT Flash Media
- A2 = Media ICT Power Point
- B1 = High Critical Thinking
- B2 = Low Critical Thinking

c. Differences in Science Literacy Elementary School Students Who Have Higher Critical Thinking Skills Provided Learning Using ICT Flash Media (A1B1) With ICT Media Power Point (A2B1)

Testing using Tukey test about the difference of science literacy ability of students who have high critical thinking ability given learning using ICT Flash media with students who have high critical thinking ability using ICT Media Power point shows that Qcount = 8.40 and Qtable = 2.042, then H0 is rejected, meaning there are significant differences in the ability of science literacy on ICT Flash media with ICT Power Point media in groups of students

who have high critical thinking skills or $A1B1 > A2B1$ because $XA1B1 = 26$ and $XA2B1 = 20.4$.

Thus, it can be concluded that the ability of science literacy students who have high critical thinking skills using ICT Flash media is higher than students who have high critical thinking skills using ICT Power point media.

d. Literacy Skill of Elementary School Students Who Have Low Critical Thinking Ability Provided Learning Using ICT Flash Media (A1B2) With ICT Media Power Point (A2B2).

Testing using Tukey test about the difference of science literacy ability of students who have low critical thinking skill given by learning using ICT Flash media with students having low critical thinking ability using ICT Power point media showed that $Q_{hitung} = 2.25$ and $Q_{tabel} = 2.042$, then H_0 is rejected, meaning there are significant differences in the ability of science literacy on ICT flash media with ICT Power Point media in groups of students who have low critical thinking ability or $A1B2 < A2B2$ due to $XA1B2 = 20.8$ and $XA2B2 = 22.3$.

Thus, it can be concluded that the ability of science literacy students who have low critical thinking skills using ICT Flash media is lower than students who have low critical thinking skills using ICT Power Point media.

Discussion

Testing the first hypothesis shows that there are differences in the ability of science literacy students who use ICT Flash media and Media ICT Power point is very significant. This is because ICT Flash media is one of the media capable of displaying images (visual), sound (audio), motion (kinestetik) at the same time. Interactive communication media makes students unsaturated and bored. Flash one of them is the learning media used to help teachers in learning. The use of ICT Flash media complements the delivery of material provided by the teacher. Teachers can broaden student interests beyond the walls of the classroom.

While the ICT Media Power point is an ICT media that seems rigid and focused only on images (visual) and sound (audio), so that the use of all the senses of students can not be functioned optimally.

In the second hypothesis based on the statistical analysis of the science literacy of elementary school students who are influenced by two independent variables in this research that is, ICT media and critical thinking ability cause the influence of interaction.

A teacher should have an understanding of the importance of using ICT media. This is to facilitate in determining which media are considered appropriate in the delivery of learning materials in accordance with learning objectives and conditions of students, including students' critical thinking skills. Each student has been blessed with a process of thinking not just remembering and relaying information that is known. Thinking is the ability to connect, manipulate, and transform the

knowledge and experience that you already have in deciding and solving problems.

The ability to think critically is one of the skills that emerge in the 2013 curriculum. Thinking that students will be able to analyze ideas or ideas in a more specific way, to classify and discriminate sharply, to choose, to identify, to study and to develop them in a more perfect direction. In addition, students are also able to develop themselves in making decisions and solve problems.

Testing the third hypothesis results obtained showed that students with high critical thinking skills will be more meaningful if given the treatment of learning with ICT Flash media. This is because ICT Flash media is able to present actual event documentation in the form of audio, Kinesthetic, visual and present it into the classroom, which will encourage students to connect the knowledge they get with their daily life.

In contrast to the use of ICT Power Point Media, students with high critical thinking skills will have difficulty. In the use of ICT Power Point Media, students can only view images and sound. So students who have high critical thinking skills can not channel their abilities. Hypothesis testing of the four results show that students who have low critical thinking ability will have difficulty to feel / observe the problem, make guesses, assess and test the hypothesis, test it and convey the conclusion. Therefore, students who have low critical thinking skills are more likely to learn in a simple way. So students feel more able to understand the learning materials. Students with low critical thinking skills who learn to use ICT Power Point Media can achieve higher success in learning. learning materials delivered more simple and easy to understand by students who have low critical thinking skills.

Meanwhile, students who have low critical thinking skills using ICT Flash media will have difficulty in the learning process. This is because the learning process focuses only on the interactive use of videos that teachers display. In addition, students will feel bored to watch the video delivered so that students do not focus in the learning process.

The findings are consistent with research by Gherardini (2016) and Jajang (2017) in a study that explains that ICT Flash Media as an experimental class is superior to students who have improved low critical thinking skills.

Conclusion

Based on the results of the analysis and discussion that have been described in this research can be obtained the findings as follows:

First difference is in science literacy skills between children who follow ICT Flash Media with children who follow through ICT Media Power point. Empirical evidence through this study showed that the scores of science literacy skills of elementary school students in students who learn to use ICT Flash media is higher than students

who learn to use ICT Power point media. Thus, efforts to improve the literacy skills of primary school students by paying attention to students' critical thinking skills can be achieved by providing ICT Flash media as a learning process of science in elementary school.

Second there is influence of the interaction between ICT Media and the ability to think critically about the ability of science literacy. Based on the statistical analysis of science literacy of elementary school students who are influenced by two independent variables in this research that is, ICT media and critical thinking ability cause interaction effect.

Third there is improvement of science literacy ability of elementary school students who have high critical thinking ability through ICT flash media. Empirical evidence through this study shows that for students who have high critical thinking skills, the ability of science literacy students who learn to use ICT Flash media is integrated into science learning in primary school proved higher than in students who learn to use ICT Power Point media. Thus, efforts to improve literacy skills of primary school students by taking into account students' critical thinking skills can be achieved by using ICT Flash media as a learning process that is integrated in the process of science teaching in elementary school.

Fourth there is improvement in the literacy ability of elementary school students who have low critical thinking ability through media ICT power point. Empirical evidence through this study indicates that for elementary school students who have low critical thinking skills, the ability of science literacy students who learn to use ICT power point media integrated into science learning in primary school proved higher than in students who learn with ICT Flash media.

Thus, efforts to improve literacy skills of primary school students by taking into account the low ability of students can be reached by using ICT Power Point Media as a learning process that is integrated in the learning process of science in elementary school.

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