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The Effect of Using the Quizizz Application on the Learning Outcomes of the Cognitive Domain of Grade V Elementary School Students on the Animal Respiratory System

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ABSTRACT
This study aimed to determine the effect of using the Quizizz application on the learning outcomes of the cognitive domain of grade V elementary school students on the animal respiratory system. The type of research used was quantitative research with a quasi-experimental design in the form of a nonequivalent control group design. The population of this study was all grade V elementary school students totalling 74 students. Samples were taken by convenience sampling technique consisting of the VA class with 25 students as the experimental class and the VC class with 24 students as the control class. Data collection was carried out using cognitive learning outcomes tests on the animal respiratory system. The data were then analyzed using an independent two-sample t-test, an Effect Size test, and an N-gain test. The results showed that: (1) there were differences in student cognitive learning outcomes between classes that used the Quizizz application and classes that did not use the Quizizz application with $t_{count} > t_{table}$*, namely 3.8133 > 2.0139; (2) the use of the Quizizz application had a high influence on the learning outcomes of the cognitive domain of students with the results of an Effect Size of 1.08, high criteria; (3) the use of the Quizizz application could improve students' cognitive learning outcomes with N-gain results of 0.5172, medium criteria. Thus, it could be concluded that there was an effect of using the Quizizz application on the learning outcomes of the cognitive domain of grade V elementary school students on the animal respiratory system.*

INTRODUCTION

Education is very influential on the process of human life, especially in the formation of better personality traits for the nation's children, where education can provide a vehicle in the form of advice and infrastructure in teaching and learning. Education also forms personality and shapes the physical

development of students so that it can bring about changes in themselves so that they can function in society.

Education also makes a huge contribution to the progress of a nation and provides a vehicle for education in translating constitutional messages as well as a means of building national character Mulyasa (2003:4). Hamalik (2013a: 3) stated that education is a process to influence students so that they can adapt themselves as best as possible to their environment, and in doing so will bring about changes in themselves that enable them to function closely in the life of society.

Education is an internal part of life. This kind of understanding may seem forced, but if you try to follow the flow and process of human life, it cannot be denied that education has coloured the long path of human life from beginning to end. Education is the beginning and becomes a human need. Education is a true guardian and is a human need. Taneja revealed that life is education and education is life, which means that talking about humans will always coincide with education, and vice versa (Yusuf, 2018:7). Education is very important for human life, so to facilitate the education process, learning is needed.

The learning process can occur due to interaction between two or more people or with the environment, learning does not only occur in school but also in those around it which can shape the learning process, in learning it can form knowledge and creativity in students in learning, because As a teacher, you must understand how a learning process that is memorable and can be remembered by students occurs, so that teachers must have strategies and approaches so that learning objectives can be achieved. According to Anitah (2007:2), learning is an important element for teachers to understand. Learning strategies are prepared based on a certain approach. Therefore, the learning strategy first approaches the learner's approaches, strategies, methods and techniques.

Hafid (2011:2) stated that a learning resource is something that can contain messages to be presented through the use of tools or by itself, it can also be something that is used to convey messages stored in the learning materials that will be provided. Teaching media is a container for messages, the material to be conveyed is the learning message and the goals to be achieved are the learning process itself. In general, media has the benefit of clarifying messages so that they are not too verbalistic, overcoming limitations of space, time, energy and sensory power, creating enthusiasm for learning, and more direct interaction between students and learning resources.

Learning is the process of student interaction with educators and learning resources in a learning environment. In essence, learning is a process of interaction between educators and students, both directly interaction such as through face-to-face activities and indirectly, namely by using various learning media (Trinova, 2012: 3). As a teacher, you must know how the learning process occurs, teachers must be creative in teaching, especially teachers must be able to use learning media so that students can understand the learning delivered by teachers at school.

Elementary science learning is the initial foundation for forming students who have scientific knowledge, skills and attitudes. Science learning is directed at finding out about nature systematically, so science is not just mastering a collection of knowledge in the form of facts, concepts, and principles but is a process of discovery and forming a scientific attitude (Trisnawati et al., 2013).

In science learning in class V, students find it difficult to understand the material on the respiratory systems of living creatures, this material is in theme 2 Clean Air for Health, sub-theme 1 How the body processes clean air in learning 1. In this material, students must know what types of animal respiratory systems are, how the respiratory process occurs, what affects the respiratory system, and factors that can damage the respiratory system in humans. This material makes it difficult for students to understand the material presented, the learning that is carried out makes students feel bored in class because of the lecture learning.

The science learning process that has occurred so far has not been implemented well. Based on the results of interviews conducted with grade V elementary school teachers, there were various problems and obstacles in the science learning process. During the learning process, students tend to be passive. This can be seen when the teacher provides an explanation of the material and allows students to ask questions about the material that has been presented, most students just remain silent. Then, when the teacher provides feedback in the form of questions, students also tend not to be able to answer. Students also have difficulty understanding the material that has been taught. This is proven when the teacher asks students to repeat material that the teacher has previously explained. Apart from that, unpleasant learning conditions are also a problem during the science learning process. This incident lacked the assistance of media tools that would attract students to study so many students' learning outcomes did not reach the KKM (Minimum Completeness Criteria) score.

Of course, this influences the science learning outcomes of students who are still under the KKM. A total of 74 class V students reached the KKM, only 31 of them or 42%, while 43 students or 58% of students did not reach the KKM. The average student score of 53 is still below the KKM. The KKM that has been set by the school is 70.

Learning media are tools or objects that can be used by teachers in the ongoing learning process, media can be visual, audio and audio-visual where teachers can convey messages or information in the form of knowledge, media also makes things easier for teachers. Media can also be an educational tool so that students' sensory abilities can function optimally, whereas media can make students more active in teaching and learning.

According to Wati (2019), media is an inherent or inseparable part of the learning process to achieve learning goals. Media functions and plays a role in regulating the effective relationship between teachers and students in the learning process. Learning media includes tools that are physically used to convey the content of learning material.

Furthermore, Rayandra (Asyhar, 2012:29) stated that through media a learning process can be more interesting and enjoyable (joyful learning). The use of learning media in the teaching and learning process can also generate increased desire and learning outcomes for students, generate learning outcomes, and have a psychological influence on students.

Meanwhile, Gagne and Briggs (Arsyad, 2017: 4) state that learning media includes tools that are physically used to convey the content of teaching material, which consists of, among other things, books, tape recorders, cassettes, video cameras, video recorders, films, and slides (picture frames), photos, drawings, graphics, television and computers. Meanwhile, Adam and Syastra (2015) stated that learning media is everything, both physical and technical, in the learning process that can help teachers make it easier to convey lesson material to students, making it easier to achieve the learning objectives that have been formulated.

One of the IT-based learning media is Quizizz, which is a web tool for creating interactive quiz games that can be used as learning media. According to Samet (2018:299), Quizizz is the best choice used as learning media which is available on Playstore on Android and Appstore on iPhone and can be used as a website via a browser on a computer. Quizizz is an application in the form of an interactive quiz which is considered capable of improving student learning outcomes because it replaces the old method of quizzing which only involves paper and pen but consists of questions created by someone on Quizizz.com to be done by other people by entering a join code.

The use of learning media that can be accessed via students' cell phones is a positive use of technology and can improve students' cognitive learning outcomes in learning. Apart from that, the features available in Quizizz can also make it easier for teachers to deliver material and assign assignments and the assessment process which can be downloaded in Excel format. If a medium can be used appropriately by the teacher then students can understand what is being conveyed and the teacher is

successful in improving student learning outcomes by seeing students' progress in achieving completion scores.

Learning outcomes are the obtained values or numbers from the assessment of one lesson. According to Hamalik (2013b: 15), learning outcomes are patterns of actions, values, understandings, attitudes, as well as appreciation and abilities. Then Nawawi (2013: 5) also stated that learning outcomes can be interpreted as the level of success of students in studying learning material at school which is expressed in the scores obtained from tests on knowing a certain number of learning materials. Learning outcomes are very important for students where students can find out how much they can understand and accept the lessons delivered by the teacher. If students have high learning outcomes then they feel happy and feel proud of what they get by studying because they get prizes or awards that they have achieved in the learning process. Dimyati and Mudijiono (2014: 140) also stated that learning outcomes are the results shown from an interaction of learning actions, and are usually shown by test scores given by the teacher. Meanwhile, Sudjana (2014: 140) divides learning outcomes into three domains, namely the cognitive domain, affective domain and psychomotor domain. Based on this description, this research aimed to determine the effect of using the Quizizz application on learning outcomes in the cognitive domain of grade V elementary school students on animal respiratory system.

RESEARCH METHODS

This type of research was quantitative research. According to Sugiyono (2018:13), quantitative is a research method based on concrete data, research data in the form of monetary figures will be measured using statistics as a calculation test tool, related to the problem being studied to produce a conclusion. The design in this research was a quasi-experimental design using a nonequivalent control group design research design in which the experimental group and control group are not chosen randomly (Sugiyono, 2018). This research was carried out at SD Negeri 1 Singkawang. The population in this study was all grade V elementary school students, totalling 74 students. The research sample was taken using a convenience sampling technique consisting of the VA class with 25 students as the experimental class and the VC class with 24 students as the control class. This research used two classes, namely the control class given learning without the Quizizz application and the experimental class given learning with the Quizizz application. The data collection technique in this research used a measurement technique, namely a test with 10 multiple-choice questions on animal respiratory system. The data analysis techniques used were an independent two-sample *t*-test, Effect Size test, and N-gain test.

RESULTS AND DISCUSSION

Results

Cognitive Domain Learning Outcomes

a. Control Class Student Learning Results

Based on the results of calculating the pre-test and post-test data obtained in the control class, the average value, standard deviation, variance, highest score, and lowest score were obtained. For details, it can be presented in Table 1.

Table 1. Calculation Results of Control Class Pre-test and Post-test Data

Control Class	*Pre-test*	*Post-test*
Average	51.25	60.83
Standard Deviation (*SD*)	12.62	14.72
Variance (s^2)	159.24	216.67
Highest Score	80	78
Lowest Score	30	32

Based on Table 1, it can be seen that for the pre-test results of students in the control class, the average

score was 51.25, the standard deviation was 12.62, the variance was 159.24, the highest score was 80 and the lowest score was 30. Then for the post-test results, the average score was 60.83, standard deviation 14.72, and variance 216.67, with the highest score of 78 and the lowest score of 32.

b. Experimental Class Student Learning Results
Based on the results of calculating the pre-test and post-test data obtained in the experimental class, the average value, standard deviation, variance, highest score and lowest score were obtained. For details, it can be presented in Table 2.

Table 2. Results of Pre-test and Post-test Data Calculation for Experimental Class

Control Class	*Pre-test*	*Post-test*
Average	51.67	76.67
Standard Deviation (*SD*)	15.79	14.04
Variance (s^2)	249.28	197.10
Highest Score	80	100
Lowest Score	20	50

Based on Table 2, it can be seen that for the pre-test results of students in the experimental class, the average score was 51.67, the standard deviation was 15.79, the variance was 249.28, with the highest score was 80 and the lowest score was 20. Then for the post-test results, the average score was 76.67, standard deviation 14.04, and variance 197.1, with the highest score of 100 and the lowest score of 50.

Based on the results of the research above, it can be seen the average learning outcomes of students on animal respiratory systems in class V between the control and experimental classes. Next, to find out the differences in learning outcomes in the cognitive domain in the science subject on animal respiratory systems in class V, a difference test was carried out and the average learning outcomes of students in the experimental class and control class were carried out.

Data Analysis Prerequisite Testing
To find out the differences in science learning outcomes regarding animal respiratory systems in class V between the experimental class and the control class, a normality test and homogeneity test will be carried out first. The normality and homogeneity tests are as follows.

a. Normality test
The normality test carried out in this study was to determine whether the post-test data scores that had been collected were normally distributed or not. The results of the normality test analysis of posttest data on science learning results for class V animal respiratory system for experimental class and control class students can be seen in Table 3.

Table 3. Data Normality Test Calculation Results

Statistics	Class	
	Experiment	**Control**
χ^2_{count}	1.9286	4.5025
Number of Students (*n*)	24	24
Level of difficulty (α)	5%	5%
χ^2_{table}	7.815	7.815
Decision	Ho accepted	Ho accepted
Conclusion	Normal	Normal

From Table 3, it can be seen that the results of the calculation of the data normality test in the experimental class obtained χ^2_{count} namely 1.9286 and χ^2_{table} namely 7.815. Because $\chi^2_{count} < \chi^2_{table}$ namely 1.9286 < 7.815, the data was normally distributed. The results of the calculation of the data normality test in the control class were obtained χ^2_{count} namely 4.5025 and χ^2_{table} was 7.815. Because $\chi^2_{count} < \chi^2_{table}$ namely 4.5025 < 7.815 the data was normally distributed, so to determine the

homogeneity of the data use the *f* formula.

b. Homogeneity Test
After the post-test score data for the experimental class and control class was calculated and it was found that the data was normally distributed, the next step will be to test the homogeneity of the data using the *f* formula. The results of data homogeneity test calculations can be seen in Table 4.

Table 4. Homogeneity Test Calculation Results

Statistics	Class	
	Experiment	**Control**
Variance (s^2)	197.10	216.67
f_{count}	0.9097	
Number of Students (n)	24	24
Level of Difficulty (α)	5%	5%
f_{table}	2.0144	
Decision	Ha accepted	
Conclusion	Homogeneous	

Based on Table 4, it can be seen that the data calculation used a formula f. It was known that the control class variance was 216.67 and was the largest variance so f_{count} was 0.9079. From f_{table} with α = 5% and *df* in the numerator 23 and *df* in the denominator 23 were obtained f_{table} = 2.0144. Because $f_{\text{count}} < f_{table}$ namely 0.9097 < 2.0144, then the experimental class and control class had the same or homogeneous variance. Because the score data in the experimental and control classes were normally distributed and homogeneous, a two-sample *t*-test was then carried out to find out whether there were differences in students' cognitive learning outcomes between classes that used the Quizizz application and classes that did not use the Quizizz application on animal respiratory system in grade V elementary school.

Hypothesis Test
a. Two-Sample *t*-Test
Based on normality and homogeneity tests, it was found that the post-test data for the experimental class and control class were normally distributed and had the same or homogeneous variance. So to test the similarity of the averages of the two classes, use the two-sample *t*-test. The results of the two sample *t*-test calculations are presented in Table 5.

Table 5. Two Sample *t*-Test Calculation Results

Group	*df*	a	t_{count}	t_{table}	Decision
Experimentation and Control	46	5%	3.8133	2.0129	Ha accepted

Based on Table 5, it was known t_{count} = 3.8133 and t_{table} = 2.0129 was obtained $t_{\text{count}} > t_{table}$ namely 3.8133 > 2.0129 then Ha accepted and Ho rejected. Therefore, it can be concluded that there were differences in learning outcomes in the cognitive domain of students between those who use the Quizizz application and those who do not use the Quizizz application in the subject animal respiratory system in class V elementary school. Because there were differences, there was an influence on learning outcomes regarding animal respiratory systems in class V elementary school between classes that use the Quizizz application and those that don't. Next, to find out how much influence using the Quizizz application has on students' learning outcomes, the Effect Size formula is used.

b. Effect Size Test
To find out the magnitude of the influence of using the Quizizz application on the learning outcomes in the cognitive domain of students in subjects on animal respiratory systems in class V, use the Effect Size (ES). The results of the effect size calculation (ES) are presented in Table 6.

Table 6. Effect Size (ES) Test Results

Calculation	Class	
	Experiment	Control
Average ($\bar{x}$)	76.67	60.83
Class Standard Deviation Control (SC)	14.72	
Effect Size (ES)	1.08	
Criteria	High	

From Table 6, it can be seen that ES = 1.08 and the criterion was high because 1.08 was at ES > 0.80. This means that it can be concluded that the use of the Quizizz application had a high influence on students' cognitive learning outcomes in animal respiratory systems in class V elementary school.

c. N-gain Test
To find out how big a significant increase in student learning outcomes in science learning is after using the Quizizz application using the N-gain formula. The results of the N-gain calculation are presented in Table 7.

Table 7. N-gain Test Results

Calculation	Results
Pre-test scores	5.17
Post-test scores	7.67
Ideal score	10
N-gain	0.5172
Criteria	Currently

From Table 7, it can be seen that the pre-test score = 5.17, post-test score = 7.67, ideal score = 10, so that an N-gain value of 0.5172 was obtained, and the criteria were medium because 0.5172 was at 0.30 < N-gain ≤ 0.70. This means that it can be concluded that using the Quizizz application had a large increase in learning outcomes in the cognitive domain in the medium category.

Discussion

There are Differences in Learning Outcomes in the Cognitive Domain of Students who Use the Quizizz Application and Students who do not Use the Quizizz Application on Animal Respiratory Systems

Researchers conducted research consisting of 2 classes, namely the experimental class and the control class. The experimental class came from class VA which consisted of 24 students while the control class came from class VC which also consisted of 24 students. The experimental class was taught using the Quizizz application, while the control class did not use the Quizizz application.

After conducting the research, the researchers gave posttest questions to students to see differences in students' science learning outcomes and how much influence using the Quizizz application had on students' science learning outcomes. Next, the researchers calculated the students' posttest results to see whether the experimental class that was given special treatment, namely using the Quizizz application, got better results than the control class that did not use the Quizizz application.

Based on the results of the calculation of students' posttest data, it was obtained $t_{count} > t_{table}$ so there is an influence on students' cognitive science learning outcomes between classes that use the Quizizz application and direct learning in science subjects regarding animal respiratory systems in class V elementary school. The differences in science learning outcomes of students in the experimental class and the control class were caused by differences in treatment between the classes.

In the experimental class, the learning outcomes of students who were treated using the Quizizz

application experienced a higher increase compared to the control class which did not use the Quizizz application. The difference in cognitive learning outcomes for experimental class students is that during the learning process, they were treated using the Quizizz application. When the learning process takes place in the experimental class, students learn with the help of the Quizizz application to help students understand the learning material. In the experimental class, the learning outcomes of students who were treated using the Quizizz application experienced differences in learning outcomes from those in the control class who did not use the Quizizz application. It can be seen that there are differences in cognitive learning outcomes for experimental class students because, during the learning process, they are treated using the Quizizz application.

This is supported by research by Annisa and Erwin (2021) with the results that the Quizizz application influences students' science learning outcomes in elementary schools. In line with research conducted by Noviyanti (2021) that there are differences in learning outcomes for students who use the Quizizz application and those who do not use the Quiziz application, where using the Quizizz application makes learning more interactive and has a positive influence.

Using the Quizizz Application Has a High Influence on Students' Cognitive Learning Outcomes on Animal Respiratory System

Based on the results of calculating students' post-test data, the Effect Size value (ES) 1.08 lies in the high criteria. This shows that the use of the Quizizz application has a significant influence on students' cognitive learning outcomes in the science subject on animal respiratory systems in class V elementary school. So it can be concluded that the large influence of using the Quizizz application on students' cognitive domain science learning outcomes is high criteria.

Effect Size calculation results (ES) are classified as high criteria because the experimental class was given treatment using the Quizizz application which had a significant influence on science learning outcomes in the cognitive domain. This is the same as research conducted by Musfirah et al. (2022) which shows that there is a significant influence of the use of the Quizizz application on the science learning outcomes of grade V elementary school students. In line with research by Wahyuillahi et al. (2021) which shows the results that the Quizizz application has a positive influence on the learning outcomes of grade V students in elementary schools.

Improving Science Learning Outcomes for Medium Category Students by Using the Quizizz Application on Animal Respiratory System

Based on the results of calculating students' pretest and posttest score data, an N-gain value of 0.5172 was obtained, which is in the medium criteria. This shows that the use of the Quizizz application provides a moderate increase in students' cognitive learning outcomes in the science subject animal respiratory systems in class V elementary school. So it can be concluded that the large increase in the use of the Quizizz application on students' cognitive domain science learning outcomes is the medium criterion.

The results of the N-gain calculation are classified as medium criteria because the experimental class was given treatment using the Quizizz application which provided a moderate increase in science learning outcomes in the cognitive domain. This agrees with research conducted by Pusparani (2020) which stated that the Quizizz application makes students more motivated to learn and work on questions with the Quizizz application so that it can improve students' understanding of the material and improve student learning outcomes. In line with research conducted by Utomo (2020) which shows that there is a significant increase in the use of the Quizizz application on student learning outcomes in the cognitive domain.

CONCLUSION

Based on the research results and general discussion, it can be concluded that there was an effect of using the Quizizz application on learning outcomes in the cognitive domain of grade V elementary

school students on animal respiratory system. This can be seen from the research results, namely (1) there were differences in students' cognitive domain learning outcomes between classes that use the Quizizz application and classes that do not use the Quizizz application, (2) the Quizizz application had a high influence on students' cognitive domain learning outcomes in animal respiratory system in class V elementary school with the results of the Effect Size test (*ES*) of 1.08, and (3) there was an increase in students' cognitive learning outcomes with medium criteria after using the Quizizz application on animal respiratory system in class V elementary school with an N-gain test result of 0.5171.

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