

The Ability to Solve Mathematical Problems in the CORE Model Assisted by the Quizizz Application in Class V

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ABSTRACT

This study aims to (1) determine the quality of the implementation of the CORE model assisted by the Quizizz application on problem solving ability in terms of learning independence of grade V students and, (2) find out the pattern of mathematical problem-solving ability of grade V students in terms of learning independence in the CORE model assisted by the Quizizz application. The method in this study uses a mix-method with sequential explanatory or combination method consisting of two sequential phases of quantitative methods and qualitative methods. Quantitative research data analysis used is normality test, homogeneity test, and average difference test. Qualitative research using Likert scale. Population and sample of 30 students of SDN 6 Arjawinangun. Data collection techniques use tests, questionnaires, and documentation. The results of the study can be concluded from the independence of learning in the core model assisted by the Quizizz application has good quality based on three stages of learning, namely; (1) The quality of planning in the valid category, this is shown in learning tools and instruments that have been classified as good. (2) The quality of the learning process, the active involvement of students, this can be seen from the implementation of learning by applying the Quizizz-based CORE learning model classified as good. (3) Quality evaluation of learning, in the category of effective. This is said to be complete and the experimental class is better than the control class. Meanwhile, the pattern of class v mathematical problem-solving

ability in terms of learning independence in the core model assisted by the Quizizz application has four stages, namely; (1) The pattern of mathematical problem-solving ability in the category of learning independence is very high. (2) Patterns of mathematical problem-solving ability in the category of high learning independence. (3) Pattern of mathematical problem-solving ability in the category of moderate learning independence.

Keywords: Mathematical Problem-Solving Ability, CORE Model Assisted by Quizizz Application.

INTRODUCTION

In human daily life, one of the fields of science that is used as a fulcrum is mathematics. According to Suwangsih (2010) that the birth of mathematics comes from all human activities empirically. The purpose of learning mathematics at school is to prepare students to face mathematics lessons and mathematical mindsets in everyday life to solve the problems faced well (Nuraisyah, 2019). The cause of the failure of mathematics learning is that students do not understand mathematical concepts (Novitasari, 2016). At the elementary school education level, students should already have basic skills before starting learning in elementary school. This is in line with NCTM (2000) suggests that there are five basic mathematical skills that are standard processes, namely problem

solving, reasoning and proof, communication, connections, and representation. From the opinion above, students should have one of the basic abilities, namely problem-solving abilities.

Polya (1985) suggests that problems in math problems will not be a problem if students have the ability to find answers and have a strong desire to solve the problem. Mathematics learning is said to develop in the ability to solve mathematical problems cannot be separated from the material given to students. The process of processing material to be used as ready-to-teach material requires creative intervention from teachers (Nurfatanah, 2018). The ability possessed by teachers in making questions that are non-routine and teachers must be active in creating routine practice questions for students. These non-routine questions are created in the Quizizz application by utilizing digital media, which can be used through devices, laptops, tabs, and computers (Salsabilah, 2020). Quizizz is a digital-based or multimedia e-learning-based learning evaluation media (Anggraini, 2020). Learning evaluation media The quizizz application is one of the interactive Android-based games by providing data and statistics about student performance (Talkah, 2021). The use of the Quizizz application in learning is supported by a learning model.

That's model is CORE, the four aspects according to Jaya (2014) are: Connecting (C) is an activity to connect old information and new information and between concepts. Organizing (O) Is the activity of organizing ideas to understand the material. Reflecting (R) is an activity to rethink, deepen, and explore the information that has been obtained. Extending (E) Is an activity to develop and expand knowledge during the teaching and learning process. The connecting, organizing, reflecting, extending (CORE) model is a learning model that uses a constructivist approach where students play an active role in the learning process and teachers only act as facilitators. According to Curwen, et al (in

Siregar, 2018) states that "the CORE model incorporates four essential elements of constructivism namely knowledge connection, information organization, reflection and knowledge expansion." The use of the CORE learning model is assisted by Quizizz learning evaluation media which aims to create new learning moods and styles and utilize technology in this era. This research was held to find out more about the ability to solve mathematical problems in building space material, to be investigated further, and to make alternative solutions that can be used by teachers, by applying the CORE learning model assisted by the Quizizz application to mathematics learning to make it easier for students to construct their thoughts and find out the problem-solving abilities possessed by these students. The purpose of this study was to determine the quality of the implementation of mathematical problem-solving capabilities in the CORE model assisted by the Quizizz application in class V.

LITERATURE REVIEW

Mathematics as one of the disciplines that teaches how to think rationally and makes sense to obtain a mathematical concept, because mathematics as one of the sciences whose existence can be learned from various phenomena (Isrok'atun & Rosmala, 2018). Mathematics is often known as a deductive science, which aims to find a truth (generalization) and is different from other sciences (Suwangsih & Tiurlina, 2010). A problem that requires a way to solve but is not directly obtained from being known (Nissa, 2015). Problems can be interpreted as individual or group situations that are being asked when they do not have rules in any way to find answers to these questions and on these problems that have characteristics (Siswono, 2018). According to Stephen P. Robbins & Timonthy A. Judge (Lestari, 2019) suggests that ability can be interpreted as the capacity of individuals to perform various tasks to be completed and found solutions in a task that is their responsibility.

Problem solving according to Kirkley, 2003 (Widjajanti, 2009) suggests that problem solving is considered as a process in which there are step rules to find students' past experiences to relate to the present to be resolved. According to Soedjadi, 1994 (Fadillah, 2009) suggests that the ability to solve mathematical problems itself is a skill that students must have to carry out mathematical problem-solving activities even though the problem is used in other sciences or in students' daily lives. Solving problems is one of the mathematics learning processes that is considered important, it can be seen from the purpose of mathematics that students get, one of which is to have the ability and skills when faced with solving a problem And in problem solving one of the important things when learning takes place because students must understand the problem both the problem and in the form of direct questions from the teacher (Wahyu, 2019).

According to Polya (1985) suggests that there are four steps to solve mathematical problems in order to find solutions in the book "How to Solve It", namely. *Understanding The Problem, Devising A Plan, Carrying Out The Plan, and Looking Back*. The relationship between steps and indicators of mathematical problem-solving ability is as follows; (1) Understanding The Problem or understanding the problem, students can apply and adapt various appropriate strategies to solve the problem; (2) Devising A Plan or creating a plan students can solve problems that arise in mathematics and involve mathematics according to context; (3) Carrying Out The Plan or executing the plan students can build new mathematical knowledge through problem solving; 4) Looking Back or re-checking students can monitor and reflect on the process of solving math problems.

There are four indicators to solve mathematical problems that will be used in this study by adjusting in the field, according to NCTM (2003), namely; (1) implement and adapt various appropriate strategies to solve problems; (2) solve

problems that arise in mathematics and involve mathematics according to the context; (3) build new mathematical knowledge through problem solving; and (4) Monitor and reflect on the process of solving mathematical problems. The CORE learning model is an alternative learning model that can be used to enable students to build their own knowledge According to Azizah (Hariyanto, 2016). The CORE model is a learning model that combines four important elements of constructivism. This is in line with the statement of Jacob (Satriani, 2015) which states that "CORE is one of the learning models based on constructivism".

This CORE learning model was chosen by researchers to develop learning assisted by the Quizizz application in supporting learning that must follow advances in the field of science and technology. The learning media that can be used in this research process is an educational application is Quizizz. Quizizz is a platform that can be accessed through the website and can be used by students in class and outside the classroom (Sukmah, 2021). Quizizz is one of the digital media in the form of practice games and online presentations that help educators to distribute teaching materials to make them easier for students to understand (Ulhusna, 2021).

MATERIALS & METHODS

In this study using the research methodology, namely mixed method, with sequential explanatory design. Sequential explanatory design is a combination method consisting of two phases, starting with sequential data collection and analysis from quantitative methods and qualitative methods (Rusmini, 2017). The purpose of the explanatory design as a whole is that quantitative data helps in explaining as well as building the results of quantitative research (Creswell, 2003). Second, conducted by Luksiana, (2018). With the results of the study, there was an increase which included the mathematical problem-

solving ability of cycle I students (46.67%) increased to (86.67%) cycle II, then there was an increase in the teaching skills of cycle I teachers (78.84%) increased to (89.06%) cycle II, and student activity also increased in cycle I (69.47%) to (79.28%) cycle II. This proves that the application of the CORE (Connecting, Organizing, Reflecting, Extending) learning model assisted by batik media can improve mathematical problem-solving abilities, teacher teaching skills, and student activities. In this explanatory design, there are two stages, the first is research carried out using quantitative methods, while the second stage uses qualitative methods.

The role of quantitative methods in this study is to obtain quantitative data that is measurable and has properties (descriptive, comparative, and associative), while this qualitative method has a role to prove, deepen, expand, weaken, and invalidate quantitative data that has been obtained at an early stage (Sugiyono, 2015). The results of the analysis of mathematical problem-solving abilities are used as the dominant quantitative used as the basis for data information. Population can be called a group of individuals who have the same characteristics of the object to be studied with the number that has been determined by the researcher so that it can be drawn into conclusions (Sugiyono, 2018). The population itself is not only the number of people studied, but includes all the characteristics possessed by the subject or object.

The part of the number and characteristics possessed by the population is called the sample (Sugiyono, 2018). In this study, what must be done to take samples is called the sampling technique. Ways for sampling in determining samples to be used in

research (Sugiyono, 2018). The sampling technique chosen by the researcher according to the needs of the study is the cluster random sampling technique. This cluster random sampling technique is in research to determine samples with certain considerations, the consideration is based on sampling based on regional groups or regional places from certain population members (Sugiyono, 2018).

Research variables proposed by Bungin, (2017) are variables determined by the researcher himself, can be changed and changed by the researcher to achieve research objectives, the results obtained from the study can be explained, sought, and analyzed to facilitate the flow of research. Research variables are objects that become a point that is valued by research, can be in the form of the nature or value of people, factors, treatment of activities carried out during the research that will cause certain variations of the person and can then be studied to draw conclusions in accordance with the data obtained (Hermawan, 2019).

This study uses instrument validity and instrument reliability to determine the results of the test are valid or valid in (Arifin, 2016). According to Sugiyono (2017) stated that "research instruments are tools used to measure natural phenomena and social phenomena". In this study, the data collection techniques used were initial test questions (pre-test) – final test (test post), questionnaires, and documentation.

STATISTICAL ANALYSIS

The following are the results of pretest and posttest problem-solving ability data in the CORE Model assisted by the Quizizz application based on a recapitulation of test result data.

Table 1 Recapitulation of Mathematical Problem-Solving Ability Test Scores

Recapitulation of Mathematical Problem-Solving Ability Test Scores	Pre-Test	Pos-Test
Jumlah Nilai	1934	2407,9
Rata - Rata Nilai	64,47	80,26
Nilai Maximal	88	91,6
Nilai Minimal	42	58,3

From the results of the recapitulation of the above scores for the experimental class got a number of 1934 for pre-test scores while for post-test scores it got a number of 2407,9. Earned an average of 64,16 in pre-test and 80,26 in post-test. In the experimental class, the maximum pre-test

score was 87,5, while the post-test score was 91,6. The minimum score on the pre-test was 41,7 while the post-test was 58,3. The assessment of learning outcomes in this study is measured based on normality tests, homogeneity tests and T-test.

1. Normality Test

Table 2 Normality Test Results Mathematical Problem-Solving Skills

	Kolmogorov-Smirnov ^a			
	Class	Statistic	df	Sig.
Data Normality Test Results Mathematical Problem-Solving Skills	Experiment Pre-test	0,154	30	0,067
	Experiment Post-test	0,146	30	0,103
	Control Pre-test	0,156	30	0,062
	Control Post-test	0,108	30	0,200*

Based on table 2 above, that the significance value obtained in the normality of mathematical problem-solving ability data in the experimental class pre-test obtained results: $0.067 > 0.05$; $0.103 > 0.05$; $0.062 > 0.05$; $0.200* > 0.05$, then it is stated that H_0

is accepted. This indicates that the mathematical problem-solving capability data for the control class is normally distributed. It can be concluded that, the mathematical problem-solving ability data is normally distributed.

2. Homogeneity Test

Table 3 Homogeneity Test Results Mathematical Problem-Solving Ability

		Levene			
		Statistic	df 1	Df 2	Sig.
Data Normality Test Results Mathematical Problem-Solving Skills	Based on mean	1,541	3	116	0,208

Based on Table 3 above, that the significance of homogeneity of problem-solving ability data is $0.208 > 0.05$, it is stated that H_0 is accepted or homogeneous data. This shows that the variance of the

experimental class mathematical problem-solving ability test and the variance of the control class mathematical problem-solving ability test come from populations that have the same variance.

3. T-Test

Table 4 Independent sample t-test results

	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Data Normality Test Results Mathematical Problem-Solving Skills	2,290	58	,026	6,667	2,911	,839	12,494

Based on the test results of the average difference between the experimental class and the control class the significance value of $0.026 < 0.05$, H_0 was rejected. It can be interpreted that, the average mathematical problem-solving ability of students in experimental classes using the CORE model assisted by the Quizizz application is better than average compared to mathematical

problem-solving skills with conventional models in control classes.

RESULT

This research includes mix method research, by combining quantitative and qualitative which aims to see the quality of implementation and pattern of mathematical problem-solving ability of grade V students

in the CORE model assisted by the Quizizz application by providing planned treatment for experimental classes. While in the control class was not given treatment. Learning planning is called good if the results of expert validation in the minimal category are good. Planning includes syllabus, lesson plans, LKPD, teaching materials, mathematical problem-solving ability test questions, learning independence questionnaires. Here are the qualities of lesson planning that have been validated by experts in this study; (1) syllabus validation gets valid results with a score of 30 contained in the good category; (2) RPP validation gets valid results with a skro of 30 contained in the good category; (3) LKPD validation gets valid results with skro 30 contained in the good category; (4) validation of teaching materials to get valid results with 30 skro contained in the good category; (5) validation of mathematical problem-solving ability test questions gets valid results with skro 30 contained in the good category; (6) Validation of the learning independence questionnaire gets valid results with a score of 30 contained in the good category.

The quality of this learning process is said to be active because students have dominant mathematical problem-solving ability test scores in very high groups. When the learning process is carried out in the field, students can be ensured that students are actively involved both physically and mentally. It is said to be active if students have one of the activeness, namely; Asking, answering, filling in assignments, and discussions when in the learning process which has become the innate nature of each individual. The quality of learning evaluation is said to be quality if the results of the experimental class learning evaluation are better than the control class. The quality of learning evaluation is calculated using normality, homogeneity, and the average difference test (t-test) which is processed by obtaining categorized data results. This research is said to be successful because it is included in the effective

category. If the quality of learning evaluation research can be categorized effectively because the experimental class is better than the control class which can be seen through the average difference test or t-test which has an explanation of each stage of data processing.

DISCUSSION

In applying the Quizizz application to the CORE model to find out the mathematical problem-solving ability possessed by grade V students, using space building materials focused on blocks, cubes, and tubes. The selection of materials is focused on building space because students often encounter it in their daily lives, and also to teach the benefits of building space for human life. In building this space, students are still confused when applied in everyday life, therefore it is chosen to build a space that is a problem in students' daily lives. In this study, the quality of learning that must be prepared which refers to the success of this research there are three aspects, namely. (1) quality of planning; (2) the quality of the learning process; (3) the quality of learning evaluation. To measure students' cognitive abilities, students' mathematical problem-solving abilities are used which are measured using indicators from NCTM and adjusted to the field. In this study, the ability to solve mathematical problems using the CORE model assisted by the Quizizz application in learning.

The research, which has been conducted by Wahyuningtyas, et al (2020). With the results of the study, the achievement and improvement of students' mathematical problem-solving ability using the CORE learning model with an open-ended approach is better than the achievement and improvement of students' mathematical problem-solving ability using expository learning. The instrument used in this study is a mathematical problem-solving ability test instrument. From the presentation of previous research above, researchers can conclude that the mathematical problem-

solving ability in the CORE model is assisted by the Quizizz application.

One of the theories that support the CORE model in the course of this research. George Polya is already known as the father of problem solving. Polya defines that problem solving is an effort to find a way out of a difficulty in order to achieve a goal with several stages or steps. In his book "how to solve it" said there are four stages to solve a problem, namely Understanding The Problem, Devising A Plan, Carrying Out The Plan, Looking Back (Polya, 1985). This theory will support in implementing the CORE learning model to improve students' mathematical problem-solving skills and learning independence.

CONCLUSION

The quality of class V mathematical problem-solving ability in terms of learning independence in the core model assisted by the Quizizz application has good quality based on three stages of learning, namely, the quality of planning in the valid category, this is shown in learning tools and instruments that have been classified as good. The quality of the learning process, the active involvement of students, this can be seen from the implementation of learning by applying the Quizizz-based CORE learning model classified as good. And the quality of learning evaluation, in the effective category. This is said to be complete and the experimental class is better than the control class.

Declaration by Authors

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