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The Effect of Game Based Learning Assisted by Fun Card Puzzle on the Conceptual Understanding of Class 5th Elementary School Students

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A B S T R A C T

Concept understanding is that students understand the meaning of a concept. So the authors apply an understanding of the concept by using a game-based learning model assisted by fun card puzzles to find out students' understanding of concepts. This study uses a quantitative method and an experimental form, namely Quasi Experimental Design with Pre-test Post-test Design. The population of this study were fifth grade students at Lerep 02 and Lerep 05 Elementary School. The data analysis technique used was the sample t test and simple linear regression test. The results show that there is an influence of the game-based learning model assisted by fun card puzzles with proven tcount = 3.712 while ttable = 2.131, with significance level 0.002. It can be concluded that the game-based learning model assisted by fun card puzzles has an effect on students' conceptual understanding

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INTRODUCTION

Indonesian Science textbooks is one branch of knowledge related to the indication of nature that is arranged systematically through human experiments or observation (Samatoa, 2011). In scientific classes, the knowledge possessed by students is related to the material studied through experimental methods. This occurs when students gain a more nuanced understanding of a topic through scientific education and continue to use that knowledge in practical situations.

In scientific classes, the knowledge possessed by students is related to the material studied through experimental methods. This occurs when students gain a more nuanced understanding of a topic through their scientific education and continue to use that knowledge in practical situations. The goal of teaching children about science is to help them develop an interest in the subject and instill in them a scientific worldview.

An education in the natural sciences is intended to help students develop an openness to scientific inquiry and the ability to think critically and find solutions by giving them the background they need to understand the world around them. The value of understanding the concept means that students are able to do more than just recognize the concept. The process of teaching concepts in science learning must be improved so that students can re-explain the material being taught in their own terms and apply it in everyday life.

Mastery of a topic requires individuals to develop conceptualization talent. If a student 'understands the meaning or significance of a concept' as defined in Suleman's (2013) definition, then that student 'already has an understanding of the concept' (Suleman, 2013). Anderson and Krathwohl in Gunawan, et al (2016) stated,"... in this form of knowledge combines 7 cognitive processes, including: interpreting, identifying, classifying, summarizing, inferring, comparing, and explaining".

From the data about understanding the concept of fifth grade students at Lerep Public Elementary School, it is known that the number of students is sequentially 21 and 17 students. The following details the average of fifth grade students at SD Negeri Lerep.

Table 1. Student Concept Understanding Data

Grade V	**Indicators**							**Average**
	Interpreting	**Identifying**	**Classifying**	**Summarizing**	**Inferring**	**Comparing**	**Explaining**	
Lerep 02 Elementary School	25%	78,57%	65,47%	54,76%	26,19 %	51,78%	42,26 %	49,15 %
Lerep 05 Elementary School	8,84%	26,86%	26,52%	41,48%	10,2 %	45,22%	11,9%	24,43 %

The low level of students' understanding of concepts is caused by the implementation of learning models that are less innovative. The probability that knowledge indicators will be fulfilled is higher when students have mastered a concept because they can explain it in their own terms and make connections between similar concepts (Suryani et al., 2016).

If we want students to gain a more nuanced understanding, we must provide them with an effective learning paradigm. The use of games as a teaching tool has been shown to be an efficient method for increasing students' conceptual understanding. Improving students' knowledge and abilities is only one of the many goals of the game-based learning paradigm, which is an interesting and interactive game. Two authors: Azan and Wong (2008). The paradigm of learning through games is independent, consisting of an introduction, the game itself, and a cover. The students realized that they were participating in a game and in the and there would be a winner.

One game that can be used as part of a game-based learning strategy. The crank game is a traditional game for children of all ages (Irawan, 2018). The learning model such as the hopscotch game was chosen by researchers because of its potential to maintain Indonesia's rich cultural heritage by preserving its traditional games. In addition to using game-based learning models, learning media can also influence students' understanding of concepts. Media like this can be used to help students better understand complex ideas, namely fun card puzzle media. This fun card is a card-shaped media in which there are questions.

THEORETICAL REVIEW

The picture below is the flow of research into the effect of game based learning assisted by fun card puzzles on the understanding of the concepts of fifth grade elementary school students.

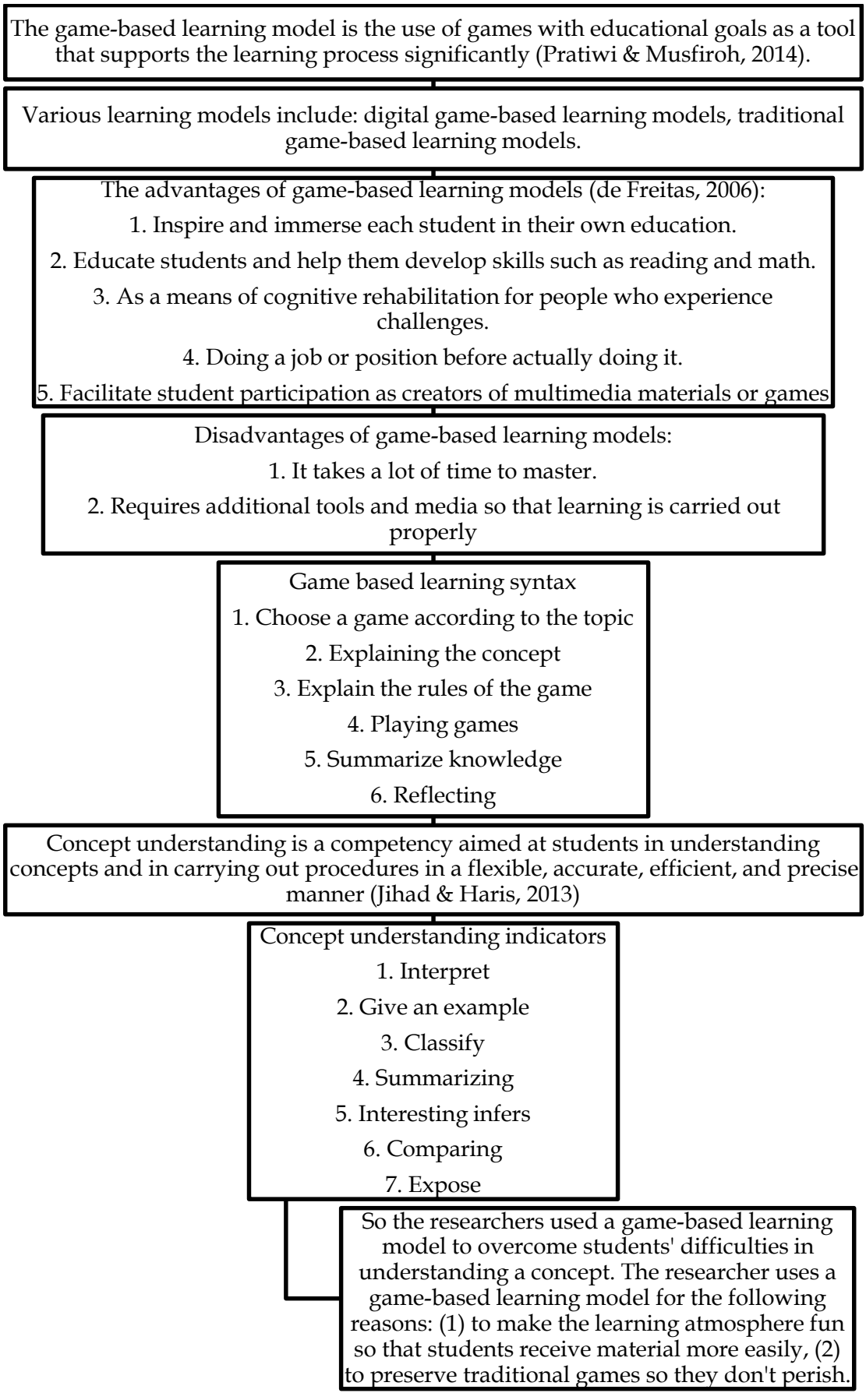

Figure 1. Model Learning

METHODOLOGY

In this study, researchers used quantitative research using quasi-experimental methods using a non equivalent control group pretest posttest design. The population in this study were fifth grade students at Lerep 02 Elementary School and Lerep 05 Elementary School. In this study, test methods (pretest and posttest) and non-test (observation, unstructured interviews, and documentation) were used to collect data. Before the research begins, the questions that will be used for research will be tested for the validity of the test items. Based on the results of the validity test of 14 questions, there were 13 questions with valid results and 1 question that was invalid. With sufficient categories there are 3 questions, and with high categories 4 questions. Then the reliability test was carried out and the Cronbach's alpha value was 0.712 in the high reliability category. Based on the difficulty level test of 14 questions, there are 7 questions in the easy category, 5 questions in the medium category and 2 questions in the difficult category. After the analysis results came out, the researcher conducted a pre-test in the control class and the experimental class. In the experimental class, after the pre-test was carried out, it was continued with the delivery of the material. On the next day the learning process uses a game-based learning model with the help of fun card puzzles to improve students' understanding of concepts. After the learning process is complete, proceed with working on post test questions. In the control class after carrying out the pre test and continuing with the delivery of material using a game-based learning model. Furthermore, students work on post test questions. After conducting research on the control class and the experimental class, the research data were tested by the normality test, homogeneity test, independent sample t test, and simple linear regression test. The following is a chart of the research process on the effect of game-based learning assisted by fun card puzzles on the understanding of the concepts of fifth grade elementary school students.

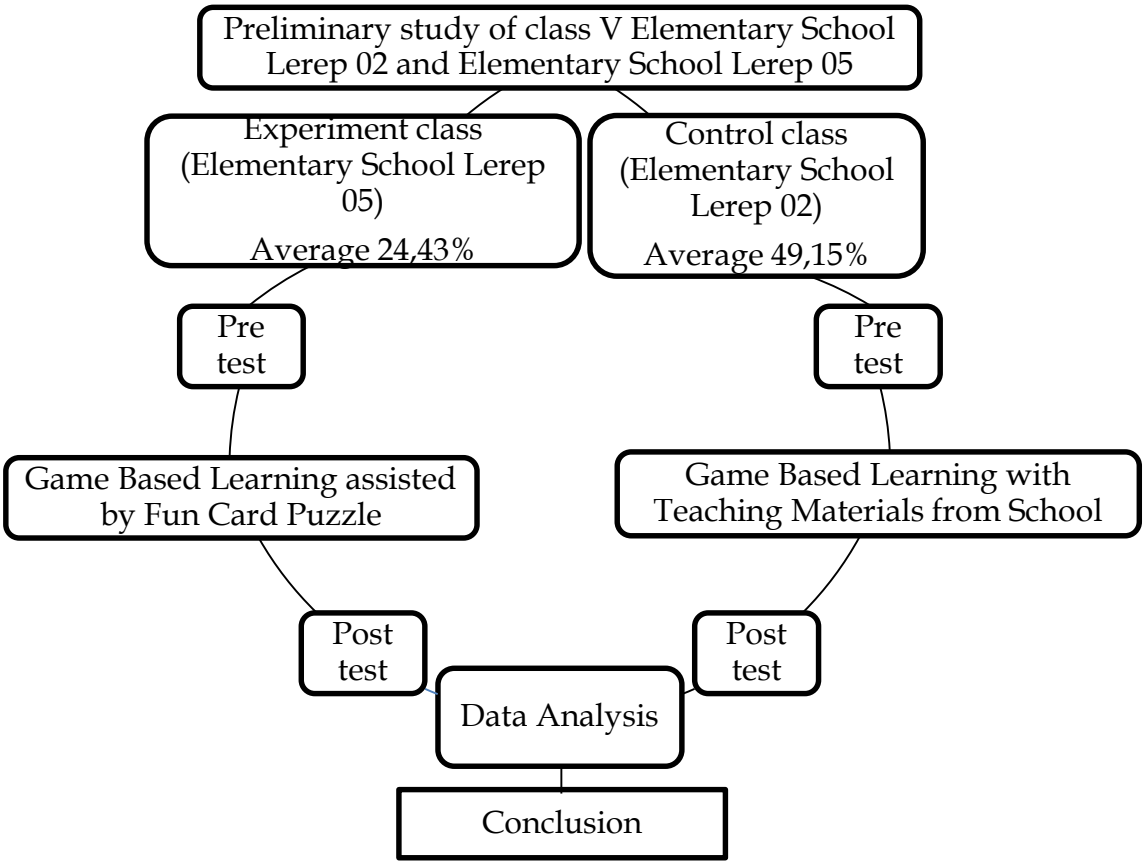

Figure 2. Research Process

RESULTS

1. Differences in the Use of Game-Based Learning Models Assisted by Fun Card Puzzle Media on Students' Conceptual Understanding

This study is an experimental investigation of the hypothesized differences between the experimental group and the control group. Researchers used a t-test for an independent sample to check this speculation. Students in both the experimental class (from Lerep 05 Elementary School) and the control class (from Lerep 02 Elementary School) participated in this study, with the Game Based Learning Model using Fun Card Puzzle media as an optional learning modality.

The researcher gave a post-test at the end of the lesson to find out whether the experimental class (SDN Lerep 05) which was taught using the Game Based Learning learning model with Fun Card Puzzle media outperformed the control class (SDN Lerep 02). which has been taught using the Game Based Learning learning model only. The average scores of the two groups after the final exam are listed below.

Table 2. Post Test Results Comparison of Average Students' Concept Understanding

Sub Indicators	Grade 5 (SD Negeri Lerep 02)	Grade 5 (SD Negeri Lerep 05)	Average
Interpreting	43,42%	61,76%	52,59%
Exemplifying	61,18%	72,79%	66,99%
Classifying	92,11%	91,17%	91,64%
Summarizing	38,82%	63,24%	51,03%
Inferring	44,08%	52,21%	48,15%
Comparing	28,29%	38,24%	33,27%
Explaining	46,71%	69,12%	57,92%
Amount	354,61%	448,53%	401,59%
Average	50,66%	64,08%	57,37%

Based on the post-test data in the control class and the experimental class there is a difference in the average results of all students, which shows that the results of the experimental class (SDN Lerep 05) are superior when compared to the control class (SDN Lerep 02).

Table 3. Independent Sample T Test Results

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Understanding Concepts	Equal variances assumed	122	.729	-3.049	34	.004	-18.260	5.989	-30.432	-6.088
	Equal variances not assumed			-3.039	33.017	.005	-18.260	6.009	-30.486	-6.034

2. The Effect of Using the Game Based Learning Model Assisted by Fun Card Puzzle Media on Students' Concept Understanding

To find out the effect of the game-based learning model assisted by fun card puzzles, the researchers used a simple linear regression test using SPSS version 25. The results of the simple linear regression test can be seen in the table below:

Table 4. Simple Linear Regression Test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.753	11.945		314	.758
	Posttest	.663	.179	.692	3.712	.002

Based on the above table shows that tcount = 3.712 while ttable = 2.131, so tcount = 3.712 > ttable = 2.131. R squared/R2 = 0.479 = 47.9%; and sig = 0.002 < 0.05; significance level of 0.05. Grade V students at Lerep 05 Public Elementary School have been shown to benefit from using the Game Based Learning approach with the help of Fun Card Puzzle media, this indicates an increase in their level of conceptual understanding.

DISCUSSION

1. Differences in the Use of Game-Based Learning Models Assisted by Fun Card Puzzle Media on Students' Conceptual Understanding

The results of the research described in the previous section showed that the experimental class (SDN Lerep 05) which used the Game Based Learning model coupled with Fun Card Puzzle media outperformed the control class (SDN Lerep 02) which used only Game Based Learning. Up to the acquisition of new knowledge. Table 4.2 displays the results of the Independent Sample T Test, providing evidence that this is so. The purpose of the Independent Sample T Test is to compare the ability to understand the concept of students in the experimental group with students in the control group after being given various treatments. Ho was rejected and Ha was accepted because the significant value showed a value of 0.033 < 0.05 which indicated that there was a difference in the average level of understanding of the experimental class and the control class.

Regardless of the results of the Independent Sample T Test, the research findings show that when students are exposed to attractive teaching models and resources, they show a marked increase in motivation to learn. According to Widiana's findings (2022), students' emotional and intellectual well-being can be encouraged when they are involved in game-based learning because it can foster a fun learning environment and encourage the development of their creative potential. This is why students find game-based learning an attractive option for education. Incorporating game principles into the educational process has been

shown to have a positive effect on students' memory and comprehension. One way to achieve a healthy middle ground between traditional teaching methods and modern teaching media is to use game-based learning. Educational games have the potential to impart a broad range of knowledge and serve as a valuable complement to traditional teaching methods. In addition, when instructional media is incorporated into classroom settings, students become more engaged, excited, and positive about the learning process as a whole. In addition, according to Aspini (2020) by using question cards students are able to analyze the questions given, then students answer according to their understanding of the questions. In addition to the use of question cards or fun cards, the use of puzzles can also improve student learning outcomes. This is in line with the findings of Ernis et al. (2021), who found that the use of puzzle media in learning can attract students' attention, enable students to learn while playing, and produce more learning experiences, all of which improve learning outcomes and motivate students to participate more actively in their learning.

Thus it can be concluded that fifth grade students' conceptual understanding is influenced differently by the application of the Fun Card Puzzle learning model assisted by Game Based Learning, with the experimental class showing superior results when compared to the control class. This is due to increased student engagement and motivation caused by the use of instructional media. Students' conceptual knowledge can be strengthened through the use of instructional media, thus enabling them to better absorb and utilize the information presented in class.

2. The Effect of Using the Game Based Learning Model Assisted by Fun Card Puzzle Media on Students' Concept Understanding

Post-test scores provide additional evidence, in addition to the basic linear regression test findings, that this is so. Students in the experimental group who were also exposed to Fun Card Puzzle media during learning showed a greater increase in posttest scores compared to students in the control group who were only exposed to the Game Based Learning learning model. Class teachers and students were interviewed, and their responses are included here.

Interviews with fifth grade teachers at SDN Lerep 02 revealed that students followed the PjBL (Project Based Learning) curriculum and watched educational videos as part of the teaching process. This means that between 81% and 85% of students have a solid understanding of key scientific ideas. Due to the widespread outbreak, teachers' utilization of Game-Based Learning pedagogical approaches has decreased significantly. Teacher use of instructional media is a common practice that has been shown to increase student motivation and engagement in class.

From the results of interviews with class teachers at Lerep 05 Public Elementary School, the learning process also used the PjBL learning model resulting in 30% of students receiving special assistance regarding understanding the concept of science. The Game Based Learning learning model has never been used by the teacher. In certain subject matter teachers often use instructional media, such as material that requires frameworks, maps, and others. The use of

learning media makes students happy and easy to understand a material during the learning process.

Researchers spoke with classroom teachers and students to get their perspectives on the advantages and disadvantages of using different forms of educational technology in the classroom. Furthermore, all respondents agree that incorporating learning materials into the educational process is more enjoyable than not doing it

It is known that the Game Based Learning model supported by Fun Card Puzzle media influences students' idea knowledge because of the research that has been given in the previous sub-chapter. This is supported by the findings of a direct linear regression analysis whose results are shown in table 3. This can be seen from the results of a simple linear regression test, namely the Game Based Learning model assisted by Fun Card Puzzle media as the independent variable that influences students' conceptual understanding, and the Game Based Learning model only as the dependent variable.

Based on the result that the game-based learning method assisted by perfect number media was able to improve students' creative thinking skills. The results of independent sample t-test showed that there was a difference in the average value of the experimental class and the control class and showed a significance level of < 0.05. The results of the simple linear regression test showed that there was an effect as evidenced by a significance value of 0.038. The results of the paired sample t-test showed a significant level of 0.00. Game-based learning methods need to be developed again by combining them with media that can improve students' creative thinking skills (Purwanti and Putra, 2022)

Educational media is very helpful for teachers in presenting the contents of their lessons to their students. That is in line with the findings from the study by Magdalena et al. (2021), who found that when teachers have skills in creating and using instructional media, students benefit. For the simple reason that good and appropriate media can facilitate teachers' ability to communicate the material being taught, thereby accelerating the attainment of educational goals productively and efficiently. Students can benefit from learning media in the classroom by gaining a deeper understanding of the material, as well as being more involved in the learning process and seeing it as something fun. Research by Sapriyah (2019) supports the idea that students can become more active participants in their own education when they have access to learning media that help them better understand complex concepts without burdening them with too much text or speech. Various types of tools and methods can be used as learning media, and according to Moto's research findings (2019), this can make it easier for teachers to carry out the teaching and learning process. Game-based learning methods need to be developed again by combining them with media that can improve students' creative thinking skills (Purwanti and Putra, 2022).

This it can be concluded that the application of the Game Based Learning paradigm at Lerep 05 Public Elementary School which is supported by Fun Card Puzzle media has an effect on students' conceptual understanding abilities. Apart from that, discussions with educators in the classroom also produced some

interesting findings and also students, the use of learning media in the learning process makes students more enthusiastic and happy during the learning process.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions from the results of the analysis along with reviews regarding the influence of the Game Based Learning model supported by Fun Card Puzzle media, namely:

The effect of using the Game Based Learning framework assisted by Fun Card Puzzle media on the understanding of students' ideas varies. This is supported by the findings of 0.005 < 0.05 from the Independent Sample T-Test at a significance level of 0.05. This leads us to the conclusion that the experimental group is qualitatively different from the control group. There was a significant difference between the experimental and control groups, with the experimental group's average score being 64.08 percent higher.

The use of the Game Based Learning framework with the help of Fun Card Puzzle media influences students' comprehension of subjects. This is supported by a significance level of 0.002 < 0.05 and the percentage value of R square/R = 0.479 = 47.9% which is found in the results of the Simple Linear Regression Test.

The following recommendations can be recommended by researchers: (1) teachers can use a game-based learning model assisted by fun card puzzles to increase students' understanding of concepts, (2) students must be more active in expressing opinions or ideas about a concept.

FURTHER STUDY

The media in this research still requires a lot of innovation and instruments in its application. It is recommended for teachers to use a game-based learning model assisted by fun card puzzles to increase students' understanding of concepts. In addition, students must be more active in expressing opinions or ideas about a concept, so it is necessary to use a more varied learning method.

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