

Canva-Assisted Cooperative Learning through the Question Students Have type: Does it Influence Students' Mathematical Conceptual Understanding?

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Abstract

Mathematical conceptual understanding is a crucial skill that students must acquire during the process of learning mathematics. However, the current level of students' understanding in this area remains relatively low. This study aims to operationally determine the effect of Canva-assisted cooperative learning through the Question Students Have (QSH) type on the mathematical conceptual understanding of seventh-grade students at SMP Plus Islam Al-Wasathiyah. The research adopts a quantitative approach with quasi-experimental methods. The sample consists of 34 students, selected using the Cluster Random Sampling technique. Data is collected through an essay test. The findings indicate that Canva-assisted cooperative learning through the QSH type has a positive impact on students' mathematical conceptual understanding.

Keywords: Canva media, Cooperative learning model, Mathematical conceptual understanding.

1 INTRODUCTION

In learning mathematics, several abilities must be possessed by students, one of which is the ability to understand concepts. Understanding concepts is very important in learning because concepts are the basis of knowledge itself (Winaya & Kurniati, 2020). According to Mulyono and Hapizah (2018), concept understanding reflects a student's ability to provide explanations and reasons in contexts or situations that involve careful and measurable application of concept definitions, relationships, or representations. Students who have the ability to understand concepts can apply a concept, especially in solving problems. Diana, Marethi, and Pamungkas (2020) also stated that understanding concepts is the basis of understanding principles and theories, so to understand principles and theories students must first understand the concepts that make up these principles and theories. Based on this opinion, it can be concluded that understanding concepts is a basic ability that must be possessed in creating and representing their knowledge to interpret, interpret, and interpret and be able to apply this knowledge in explaining various situations. Understanding this concept is very important, especially in mathematics learning, because mathematics learning needs to understand concepts not just memorize concepts.

In fact, mathematical conceptual understanding has not been fully achieved by students as the results of observations by researchers in one of the VII classes of SMP Plus Islam Al-Wasathiyah by providing tests based on indicators of concept understanding showed a relatively low average of 17,361. Many factors cause students' mathematical conceptual understanding to be low, one of which is the learning provided by the teacher. In general, teachers play more roles than students, students only listen to explanations given by the teacher from the beginning to the end of learning and only some students are active in asking questions while others are passive. Teachers as the

spearhead in the implementation of learning, should strive for meaningful learning for students through creativity and learning innovations that help achieve learning goals and objectives (Winaya & Kurniati, 2020). Students' understanding of concepts can be helped through appropriate learning models. Winaya and Karianti (2019) stated that the inaccuracy in choosing a learning model has implications for the emergence of boredom, the subject matter is poorly understood and monotonous, resulting in an indifferent attitude in learning. The selection of models needs to be right so that students have an interest in understanding the learning concepts conveyed by the teacher.

Looking at the existing problems, one model that can be used is the cooperative learning model type of QSH. Cooperative learning can be interpreted as learning together, helping each other in learning, and ensuring that everyone in the group achieves predetermined goals or tasks (Winaya & Karianti, 2019). By discussing together with their group mates, students can express their opinions to each other so that students are more active in learning. According to Suprijono (2015), QSH was developed to train students to have the skills and ability to ask questions. This model provides students with the opportunity to choose or submit questions in writing, so that what students learn is indeed what students want and must be in accordance with planned learning objectives. Suardi, Suarsana, and Pujawan (2018) stated that the purpose of students in choosing or making questions is to encourage students to think about solving problems in a problem, investigate and assess students' mastery of the subject matter, arouse student interest so that it will desire learn it and attract students' attention in learning. Learning in the model type QSH provides opportunities for students to be able to carry out learning that provides reciprocal situations, both between students and between students and teachers so that it is suspected to be able to optimize the understanding of students' concepts allegedly better. In addition to the right learning model, the use of tools or media is also needed as a liaison between teachers and students. According to Nurrita (2018), learning media is a tool that can help the teaching and learning process so that the meaning of a message conveyed becomes clearer and the objectives of learning or education can be achieved efficiently and effectively. With the existence of tools in learning, good communication is established between teachers and students, so that learning or messages conveyed can be conveyed clearly. Media that can be used by utilizing technology, one of which is Canva. Canva is one of the online applications that can be used to create learning media (Rahmatullah, Inanna, & Ampa, 2020).

Several research results revealed that QSH can affect students' mathematical conceptual understanding, such as research conducted by Winaya and Kurniati (2020) at SD Tegaljaya stated that the QSH learning model has a significant effect on Mathematical conceptual understanding. Research by Septiani, Juniantri, and Astawa (2020) at SMP Negeri 1 Negara and research conducted by Suardi et al. (2018) at SMK Negeri 1 Singaraja stated that the QSH learning model has a positive effect on Mathematical conceptual understanding. In this case, researchers tried to use the canva-assisted cooperative learning through the QSH type to determine its effect on students' mathematical conceptual understanding. The formulation of this research problem is "Does the canva-assisted cooperative learning through the QSH type affect the understanding of students' mathematical concepts?". The purpose of this study was to determine the effect of the canva-assisted cooperative learning through the QSH type on students' mathematical conceptual understanding.

2 RESEARCH METHODS

This research used a quantitative approach with quasi-experimental methods and The Posttest Only Control Group Design, carried out at SMP Plus Al-Wasathiyah.

Sampling in this study was taken using Cluster Random Sampling from all grade VII students of SMP Plus Islam Al-Wasathiyah for the 2022/2023 academic year totaling 58

students. To collect data in this study, test techniques were used referring to indicators of Mathematical conceptual understanding in data presentation material. The form of test given is in the form of 6 essay questions with a discussion of data presentation.

3 RESULT AND DISCUSSION

In this section, the results of the data analysis are presented. It is explained in several subsections such as experimental class test result, control class test result, test prerequisites, hypothesis test, and interpretation of research findings.

3.1 Experimental Class Test Result

The results of this study are in the form of test score data for understanding students' mathematical concepts as an impact of the application of the canva-assisted cooperative learning through the QSH type in experimental classes. The student's score of Mathematical conceptual understanding is obtained through a post-test. The scores of students who received learning using the cooperative learning model type of QSH obtained an average score = 62.5; median = 61.1; mode = 58.9; variance = 281.25; standard deviation = 16.77; highest value = 97; lowest value = 23. The frequency distribution of experimental class result data is presented in Table 2.

Table 2. Frequency Distribution Experimental Class					
No	Class Interval	Midpoint	Frequency		
			Absolut	Cumulative	Relative
1	23 – 37	30	1	1	5.55%
2	38 – 52	45	4	5	22.2%
3	53 – 67	60	7	12	38.8%
4	68 – 82	75	3	15	16.67%
5	83 – 97	90	3	18	16.67%

Table 2 shows that the mathematical understanding of experimental class students was 6 students who obtained scores above Kriteria Ketuntasan Minimal (the minimum passing grade, KKM) or 33.34%. While 66.66% still have to improve the ability to understand mathematical concepts in data presentation material. The experimental class data has presented in Figure 1.

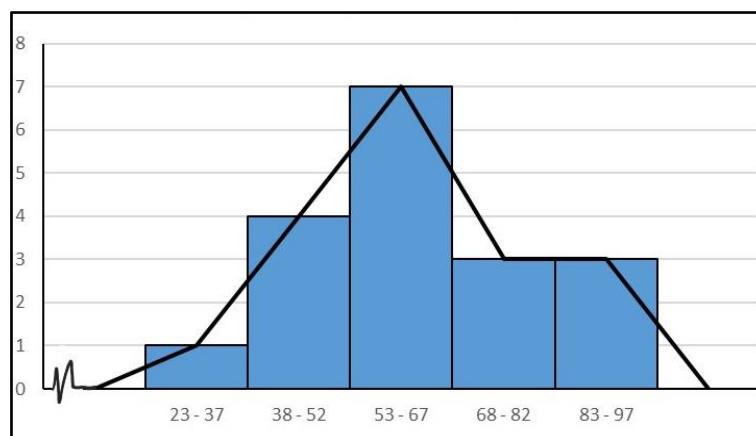


Figure 1. Conceptual Understanding of Experimental Group Students

3.2 Control Class Test Result

The results of this study are in the form of test score data for understanding students' mathematical concepts as an impact of the application conventional learning in control

classes. The scores of students who received learning using the cooperative learning model type of QSH obtained an average score = 62.5; median = 61.1; mode = 58.9; variance = 281.25; standard deviation = 16.77; highest value = 97; lowest value = 23. The frequency distribution of control class result data is as follows.

Table 3. Frequency Distribution Control Class

No	Class Interval	Midpoint	Frequency		
			Absolut	Cumulative	Relative
1	17 – 29	23	2	2	12.5%
2	30 – 42	36	3	5	18.75%
3	43 – 55	49	6	11	37.5%
4	56 – 68	62	4	15	25%
5	69 – 81	75	1	16	6.25%

Table 3 shows students' mathematical conceptual understanding in the control class data presentation material, only 1 student obtained a score above KKM or 6.25%. While 93.75% still have to improve the ability to understand mathematical concepts in data presentation material. Control class comprehension data can be presented in histogram form as shown in Figure 2.

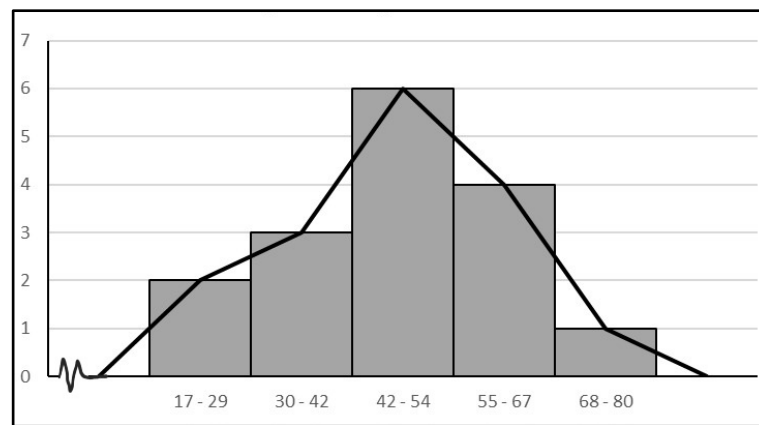


Figure 2. Conceptual Understanding of Control Group Students

3.3 Test Prerequisites

Before the hypothesis test is carried out, prerequisite testing is first carried out on the distribution of data which includes normality tests and homogeneity tests.

3.3.1 Normality Test

The normality test is performed to assess the distribution of data in a group of data or variables that are normally distributed or not. The calculation results of the normality test can be seen in Table 4.

Table 4. Normality Test Results

Class	n	α	L_0	L_{table}	Conclusion
Experiment	18	0.05	0.155	0.200	Normal
Control	16	0.05	0.154	0.213	Normal

Based on Table 4, it shows that the data derived from the experimental class and the control class are seen from $L_0 < L_{table}$ because $0.155 < 0.200$ and $0.154 < 0.213$ then H_0 accepted and H_1 rejected to a significant degree $\alpha = 0.05$. It can be concluded that the normality test results on the post-test data in experimental and control class are normally distributed.

3.3.2 Homogeneity Test

The homogeneity test in this study was used to ensure that the data group in experimental class and control class came from a population that had the same variance (homogeneous). The results of the homogeneity test experimental and control class calculation can be seen in Table 5.

Table 5. Homogeneity Test Results

Class	Variance	min	F_0	F_{table}	Conclusion
Experiment	281.25	17	1.406	2.368	Homogeneous
Control	200.027	15			

Based on Table 5, it shows that $F_0=1.406 < 2.368=F_{table}$, which means indicating that H_0 accepted so that it can be concluded that the experimental class and the control class have the same variance or are homogeneous.

3.4 Hypothesis Test

After the data analysis is fulfilled, then a hypothesis test is carried out using a t-test. The results of hypothesis testing using t-tests are presented in Table 6.

Table 6. Hypothesis Test Results

Class	$\bar{X}$	N	S^2	S_{gab}	t_0	t_{table}
Experiment	62.5	18	281.25	15.594	2.671	1.694
Control	48.19	16	200.027			

Based on Table 5, it can be seen that $t_0=2.671$ and $t_{table}=1.694$. Therefore $t_0 > t_{table}$, it can be concluded that there is an impact of the canva-assisted cooperative learning through the QSH type on students' mathematical conceptual understanding.

3.5 Interpretation of research findings

The results of the prerequisite test prove that the experimental class and the control class are from a normally distributed population and have the same or homogeneous variance. The hypothesis test also shows that the cooperative learning model type of QSH affects students' mathematical conceptual understanding. Based on the analysis test and hypothesis test that has been done, it shows that the statistical hypothesis proposed in this study is acceptable. This influence can also be seen from the difference in the results of the students' comprehension of mathematical concepts test in the experimental class who obtained the highest score of 97 and the lowest score of 23, while in the control class, they obtained the highest score of 80 and the lowest score of 17. The existence of a control class as a comparison reinforces that mathematics learning using the QSH type model is more effective.

This is in line with the results of research by Suardi et al. (2018) asserted that students' mathematical conceptual understanding, when engaged in Question Students Have (QSH) learning assisted by Powtoon animation media, is higher than the understanding of students who undergo conventional learning. These results are obtained because the QSH type model optimizes the wants and needs of students so that it will maximize the potential of students. Similarly, with the results of research by Bakara, Utari, and Verayanti (2023), the ability to understand concepts that can be achieved by students using Canva media is 74.79%. The results of the study show that the development of learning videos using the Canva application can be declared valid, practical, and has a potential effect on students' ability to understand mathematical concepts. The results of previous research turned out to be in line with the results of this study that Canva's media-assisted QSH type learning model can affect students' mathematical understanding. However there are still differences with this study, the research of Suardi et al. (2018) saw the influence of the QSH learning model with the

help of Powtoon animation media. In the research of Bakara et al. (2023), the focus is on developing learning videos using Canva media to understand students' mathematical concepts.

Based on the data obtained from the posttest of mathematical conceptual understanding, there is an impact of the canva-assisted cooperative learning through the QSH type on students' mathematical conceptual understanding. Thus, this study succeeded in proving the research hypothesis proposed that there is an impact of the canva-assisted cooperative learning through the QSH type on students' mathematical conceptual understanding in the material for presenting grade VII data of SMP Plus Islam Al Wasathiyah.

4 CONCLUSION

Based on the results of the research that has been done, it can be concluded that there is an impact of the canva-assisted cooperative learning through the QSH type on students' mathematical conceptual understanding in data presentation material. This can be seen from the results of the calculation of the hypothesis test using the t -test, obtained values $t_0=2.671$ and $t_{table}=1.694$. By comparing values t_0 and t_{table} obtained $t_0 > t_{table}$. It means that there is an impact canva-assisted cooperative learning through the QSH type has a positive impact on students' mathematical conceptual understanding.

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