IMPROVING STUDENT LEARNING OUTCOMES USING THE JIGSAW TYPE COOPERATIVE LEARNING MODEL IN SCIENCE LESSONS ON THE RESPIRATORY SYSTEM MATERIAL HUMANITY IN CLASS V SDKr. MUTIARA KASIH STUDENTS

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Abstract

Education is an essential requirement for individuals, leading to continuous efforts in enhancing the quality of education to produce highly skilled human resources. One of these efforts involves implementing the Jigsaw type Cooperative Learning Model, which aims to develop students' precision and cooperation skills during group discussions. The objective of this study is to assess the responses and learning outcomes of fifth-grade students in the science subject, specifically on the human digestive system, using the Jigsaw type cooperative learning model. This research adopts a quasi-experimental approach with a Pretest Posttest Control Design. The study population consists of fifth-grade students at SDKr Mutiara Kasih, and the sample is determined using a saturated sampling technique, resulting in a sample size of 16 students. Data collection methods include observation, tests, questionnaires, and documentation. The independent variable in this research is the Jigsaw type cooperative learning model, while the dependent variable is the students' learning outcomes in science, specifically on the Human Digestive Equipment material. The data analysis technique employed in this study is the N-Gain test. The findings of this research demonstrate that the demonstration learning method has a significant impact on the learning outcomes of fifth-grade students at SDKr Mutiara Kasih. Furthermore, there is a notable difference in the influence between demonstration learning and conventional learning in the science subject for fifth-grade students.

Keywords: *Education, Jigsaw Type Cooperative Learning Model, Science Learning Outcomes*

1. INTRODUCTION

Education is a primary need for a country in order to develop its human resources, so that it becomes a country that is able to compete in this era of globalization. To address this, the Indonesian government has made many changes to the curriculum, which have been adapted to the objectives of national education, namely developing abilities and forming a dignified national character and civilization in order to make the life of the nation and state intelligent, as well as developing the potential of students to become human beings of faith. and be devoted to God Almighty, have noble character, be knowledgeable, capable, independent, healthy, creative, and be a democratic and responsible citizen (Nurhayati, 2020).

Efforts to improve the quality of education are continuously carried out both conventionally and innovatively. This is even more focused after it was mandated that the goal of national education is to improve the quality of education at every type and level of education. The government, in this case the Minister of National Education, also launched the "Education Quality Improvement Movement" on May 2 2018. There are at

least three factors that cause the quality of education to not change evenly, namely the policy and implementation of national education using an education production function approach which is not implemented consistently, the implementation of national education is carried out in a bureaucratic-centralistic manner, and the role of the community, especially parents of students, in the implementation of education has so far been minimal (Sudarmi, 2020).

Based on observations made by researchers during the learning process of class V students in science subjects at SDKr Mutiara Kasih, there are problems including (1) teachers do not apply innovative learning models, (2) Students find it difficult to grasp the material presented by the teacher, (3) Students experience difficulty in conveying their thoughts and, (4) Students experience difficulty in expressing ideas or opinions. There are several factors that cause this problem, including the teacher not using innovative models or strategies to explore students' ideas, so that students appear confused when asked again about the material that has been taught.

The teaching and learning process is influenced by several main components that are interrelated, including teachers, students, and the learning model used. Therefore, education cannot be separated from the learning process obtained from educational institutions, namely schools (Adinugraha, 2017). According to Fikri & Ade (2018) the learning process is a series of communications between students and teachers, the learning process is effective if there is a transfer of material delivered by the teacher which can be absorbed into the students' cognitive structure. With effective learning, it can make it easier for students to learn or receive learning.

According to Basuki (2015) learning techniques are one of the ways a person implements a method. This includes the use of learning models, strategies and media which must always be innovated according to the learning material. Thus, to raise students' motivation and interest in learning, one of which is the application of the cooperative learning model with group learning methods.

In line with the problems of student learning activities, a learning model is needed that uses problems as a context for students to learn about critical thinking and skills and acquire essential knowledge and concepts from science subject matter through a cooperative learning model. Because this model helps students be active in learning activities through group activities. One of the cooperative learning models that is quite interesting to research is the jigsaw type cooperative approach model. According to Induf, (2021) the Jigsaw Cooperative Learning Model is a cooperative learning model where students learn in small groups consisting of 4-6 people heterogeneously and work together with positive interdependence and are responsible for the success of the part of the material that must be studied and delivering the material. it to other group members.

The Jigsaw type Cooperative Learning Model can train students' accuracy and accuracy, train good cooperation in groups when discussing, train students to be able to convey explanations orally and coherently during presentations, and train the courage to express problems that have been shared by the teacher in each group (Ariyanto et al., 2018). Various studies have been conducted regarding cooperative learning which shows that this model approach is much better than other approaches, as according to Hakim (2015) shows that the success of cooperative learning is indicated by two important factors: (1) the learning group must demonstrate active learning through group discussion interactions; and (2) teachers must carefully design and organize learning to suit the

expected learning objectives. According to Husnaeni (2016) stated that the use of learning models is able to encourage the learning interaction process for students so that they can improve their ability to understand the material provided.

Based on the characteristics of the Jigsaw type, the Human Digestive Equipment material is suitable to be applied because this human digestive equipment material has a broad scope which is suitable for dividing the subject matter. Through the Jigsaw type cooperative learning model, science learning outcomes on Human Digestive Equipment material for class V students and student responses to Natural Science subjects can be improved. This research uses the demonstration learning method. The Demonstration Method is a teaching method by demonstrating items, events, rules and the sequence of carrying out activities, either directly or through the use of teaching media that is relevant to the subject matter or material being presented. The advantage of the demonstration method is that verbalism can be avoided, students are directed to pay direct attention to the learning material being explained, the learning process will be more interesting, by observing directly, students will have the opportunity to compare theory and reality. (Saputra & Priyanto, 2016). The advantage of the demonstration method is that it focuses attention so that it makes teaching clearer and more concrete, besides that it attaches more experiences and impressions as a result of learning to students, and makes the teaching process more interesting (Trisnawaty & Slameto, 2017).

Based on the problems above, the researcher is interested in conducting classroom action research with the title "Improving Student Learning Outcomes with the Jigsaw Type Cooperative Learning Model in Science and Science Lessons on Human Respiratory System Material for Class V Students at SDKr Mutiara Kasih." With this research, it is hoped that it can provide support to students in providing understanding, skills, mastery of concepts in each material provided, so that it has an impact on learning outcomes. This research aims to determine the responses and learning outcomes of class V students on the science subject material on the human digestive system using the Jigsaw type cooperative learning model.

2. LITERATURE REVIEW

2.1. Learning Method

In the teaching and learning interaction process, the methods required by a teacher vary greatly according to the goals to be achieved after teaching ends. A teacher will not be able to carry out his duties if he cannot master any of the teaching methods that have been formulated and put forward by educational experts. Apart from that, in the teaching and learning process there cannot be two-way interaction between teachers and students. There are several known methods in learning, including the lecture method, demonstration method, assignment method, experimental method, jigsaw method, question and answer method, and so on.

2.2. Jigsaw Learning Method

The jigsaw method is a type of active learning which consists of heterogeneous learning teams consisting of 4-5 people (the material is presented by students in text form) and each student is responsible for mastering part of the learning material and is able to teach that part to other members Method jigsaw was developed and tested by Elliot

Aronson and friends at the University of Texas, and friends at John Hopkins University in 1978.1 Jigsaw is a cooperative learning model, with students studying in small groups consisting of 4-6 people heterogeneously. The learning material given to students is in the form of text and each member is responsible for completing the part of the subject matter that must be studied.

2.3. Demonstration Learning Method

The demonstration method is a learning strategy where students practice specific skills learned in class through demonstrations. Students are given time to practice their own scenarios and determine how they illustrate the skills and techniques just explained. Demonstration in relation to the presentation of information can be interpreted as a demonstration or demonstration of how to do or do something.

The advantages of the demonstration method include: a) Students' attention can be focused more on the lesson being taught, b) Mistakes that occur when the lesson is being lectured can be overcome through observation and concrete examples, by presenting actual objects, c) The concepts received by students are more in-depth so that it lasts longer in their souls, d) Provides strong motivation for students to be more active in studying because students are involved in the lesson and e) Students can participate actively and gain direct experience and can gain the skills to be able to answer all problems that arise in each student's mind because take part directly.

Disadvantages of the demonstration method include: a) It requires quite a lot of time, b) If there is a shortage of media, the demonstration method becomes less efficient, c) It requires quite expensive costs, especially to buy the materials, d) Requires a lot of energy, e) If students are not active then the demonstration method will be ineffective and f) Facilities are inadequate. Meanwhile, the benefits of the demonstration method are: a) Students' attention can be more focused, b) Students' learning processes are more focused on the material being studied and c) Experiences and impressions as a result of learning are more embedded in students.

3. RESEARCH METHODS

This type of research is quasi-experimental research with a Pretest Posttest Control Design. The population in this study were fifth grade students at SDKr Mutiara Kasih. The sampling technique uses saturated sampling. The research sample was 16 students in class V of SDKr Mutiara Kasih. This research uses primary and secondary data types. The data collected in this research are as follows: 1) Obtained from results directly from the source of the research, and 2) Another data source center is 16 students in class V of SDKr Mutiara Kasih. Meanwhile, secondary data in this research is through tests related to developments in a place and can also be through documentation which can be in the form of notebooks, lesson plans and syllabi.

The data collection technique in this research is using observation, tests, questionnaires and documentation. The independent variable in the research is the Jigsaw type cooperative learning model. Meanwhile, the dependent variable is the results of students' science learning on the Human Digestive Equipment material. The data analysis technique in this research uses the N-Gain test to determine the increase in student learning outcomes on the concept of the human digestive system and the t test to

determine whether the two groups have the same average score or are significantly different.

4. RESULTS AND DISCUSSION

This research is an experimental research, therefore before the respondents are given treatment, they are first given pre-test questions in the two sample classes to find out the initial results of the students, after that the students in the experimental class are given treatment in the form of a demonstration learning method which is carried out in two meetings. , after the treatment was completed, students were given post-test questions to see whether there were differences and influences between the control class which was given teaching as usual and the experimental class which was given treatment in the form of a demonstration learning method.

The aim of this research is to determine the effect of using the demonstration learning method on science learning outcomes in Class V of SDKr Mutiara Kasih. The subjects in this research were the VA class, totaling 16 students, as the experimental class and the VB class, totaling 16 students, as the control class. The type of research was quasi-experimental.

Before conducting research in class V, the researcher conducted an instrument test first in class V with the aim of finding out valid questions, after that the researcher conducted a pretest and posttest in the control class and experimental class. The pretest and posttest results obtained are used as data to calculate normality and homogeneity, then tested in hypothesis testing. The following is data on the learning outcomes of experimental class and control class students.

Table 1. Descriptive Statistical Analysis

	N	Min	Max	Mean	Std. Deviati
Before	16	60	95	81,94%	
Afer	16	64	100	84,75%	
Valid N (listwise)	16				

Source: Processed data (2023)

Based on table 1, it can be stated that the scores from before the implementation of the jigsaw learning method in the pre-test results were a minimum score of 60, a maximum score of 95, an average score (mean) of 81.94%, and after the implementation of the jigsaw learning method in the post results. -test, namely a minimum score of 64, a maximum score of 100, an average score (mean) of 84.75%. Initial learning result data was obtained before being given treatment and final learning result data was obtained after being given treatment, namely the use of the demonstration method in class. experiments and conventional methods in the control class.

4.1. Normality Test

The normality test is used to determine whether the data obtained from each variable is normally distributed or not. Normality test calculations use the Shapiro-Wilk formula with a significance level of 0.05. To obtain normality test results, student pre-test

and post-test score data were used, then the data was processed using the SPSS V.16 for Windows application.

Table 2. Normality Test Results
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Before	.190	16	.125	.854	16	.016
After	.200	16	.085	.928	16	.228

a. Lilliefors Significance Correction

Source: Processed data (2023)

The data shows that the pre-test can be seen that the experimental class obtained a significance value of 0.19 and the control class obtained a value of 0.18. These results show that the significance value for the experimental class and control class is > 0.05, so it can be concluded that the pre-test data for the experimental and control classes is normally distributed. From the post-test results data, it can be seen that the experimental class obtained a significance value of 0.308 and the control class obtained a value of 0.053. These results show that the significance value for the experimental class and control class is > 0.05, so it can be concluded that the post-test data for the experimental and control classes is normally distributed.

4.2. Homogeneity Test

The homogeneity test is used to determine whether the variance of the experimental class post-test data and the control class post-test data is homogeneous or not. Based on the significance value (Sig.) Based on Mean of 0.751 > 0.05, it can be concluded that the variance of the experimental class post-test data and the control class post-test data is the same or homogeneous.

4.3. Hypothesis Test

After normality and homogeneity tests have been carried out and the results show that the research sample comes from a normal distribution population and the sample variance is homogeneous, then hypothesis testing can be carried out. The hypothesis of this research is:

Ha : $\mu 1 = \mu 2$ (The Jigsaw method influences the science learning outcomes regarding the digestive system in Class V SDKr Mutiara Kasih).

Ho : $\mu 1 \neq \mu 2$ (The Jigsaw method has no effect on science learning outcomes regarding the digestive system in Class V SDKr Mutiara Kasih).

After carrying out the t-test with an alpha level = 0.05, an interpretation of (thit) is formed with the conditions: thit ≥ ttab, meaning Ha is accepted and Ho is rejected thit ≤ ttab, meaning Ha is rejected and Ho is accepted.

Table 3. T test Results
Paired Samples Test

			Pair 1
			Before - After
Paired Differences	Mean		-3.063
	Std. Deviation		2.594
	Std. Error Mean		.649
	95% Confidence Interval of the Difference	Lower	-4.445
		Upper	-1.680
t			-4.722
df			15
Sig. (2-tailed)			.000

Source: Processed data (2023)

Based on table 3, it is known that the Sig value. (2-tailed) is 0.00 and the value is 0.00 > 0.05, so H_0 is accepted, so it can be concluded that learning using the demonstration method in the experimental class is not significantly different from the control class using conventional methods. "If we compare it with previous research conducted by Dimas Endar Septian (2017) in Class V SDKr Mutiara Kasih." Based on the test results, you can get a t count of -4.722 with a sig value of 0.00. Because t count is -4.722 < t table 1.753, and the significance value is 0.000 < 0.05, then this result shows that there is a significant difference. Therefore, the demonstration method has a positive influence on the learning outcomes of class V students at SDKr Mutiara Kasih.

4.4. Data on Pretest and Posttest Results Jigsaw Learning Method

Table 4. Comparison of Student Learning Outcomes Before and After

No	Name	Minimum Completeness Criteria (KKM)	Score		Note
			Before	After	
1	Adriel Denyris Ekaputra	75	90	92	Complete
2	Christian darrel Timothy	75	95	100	Complete
3	Danzel Vanynard Alexis	75	85	88	Complete
4	Excel Cristian Wahyono	75	82	80	Complete
5	Frederick Robert Arjuna	75	90	92	Complete
6	Gabriel Ivander Tan	75	85	88	Complete
7	Hendrico Valentino	75	77	80	Complete
8	Hendrich Axel Rudyanto	75	78	80	Complete
9	Josephine loviandayu Karuniawan	75	60	72	Not Complete
10	Keyla Safira Natalia Wijaya	75	60	64	Not Complete
11	Keyvaldo Faust Janneta	75	79	80	Complete
12	Marsha nathania Desbrina	75	90	92	Complete
13	Richard Obiora Sitnjak	75	86	88	Complete
14	Rebecca wilson	75	79	80	Complete

No	Name	Minimum Completeness Criteria (KKM)	Score		Note
			Before	After	
15	Stephanie angel Kurniawan	75	85	88	Complete
16	Sie Mikhael Fidel Asyeronial	75	90	92	Complete
Total		1311	1356		Complete
Mean		81,9375	84,75		
Complete number of students		14	14		
Percentage of students who complete		87,5	87,5		
The number of students is incomplete		2	2		
The percentage of students who do not complete		12,50%	12,50%		
The highest score		95	100		
The lowest score		60	64		

Source: Processed data (2023)

Based on the table above, it shows the student learning outcomes before and after implementing the jigsaw type learning method with demonstrations. Before implementing the jigsaw type learning method with demonstrations, the students' average score was 81.94%. There were 14 students who got scores above the KKM with a percentage of 87.5%, and 2 students got scores below the KKM with a percentage of 12.5%. With the highest score of 96 and the lowest score of 60. Then, after implementing the jigsaw type learning method with demonstrations, the students' average score increased by 84.75%. There were 14 students who got scores above the KKM with a percentage of 87.5%, and 2 students got scores below the KKM with a percentage of 12.5%. With the highest score of 100 and the lowest score of 64. This shows that student learning outcomes have improved by using the Jigsaw type cooperative learning model and Project Based Learning (PJBL).

This means that there is a significant influence in the experimental class using the Jigsaw type cooperative learning model on students' science learning outcomes on the subject of the human digestive system. Jigsaw type cooperative learning has a positive influence on learning (Putra et al., 2018), (Herawati & Irwandi, 2019), (Kasih et al., 2018), (Arini, 2016), (Huda & Arief, 2013). In general, it can be said that the learning process using the Jigsaw type cooperative learning model provides increased student learning outcomes. Apart from that, it makes students able to respect each other's opinions and work together to solve problems. This can be formed due to cooperation or collaboration between students during the learning process.

4.5. Discussion

By looking at the comparison of the pre-test and post-test results, there is quite a significant increase, both in terms of learning completion and the results of the class average score. Of the 16 students, there are still 2 students who have not achieved completeness. This means that these two students must receive special services, but even though these 2 students have not achieved completeness, on the other hand they are still

enthusiastic about learning. Meanwhile, the highest score on the pre-test has increased with 6 students getting a score of > 70, this is because these six children, apart from having sufficient ability, are supported by a sense of enjoyment and learning, so they get optimal scores. In general, from the results of observations and tests before the pre-test, up to the post-test, it can be concluded that through implementing learning using the demonstration method, science learning outcomes can improve digestive system competency.

From the research results, it can be seen that there has been an increase in understanding of the digestive system material for Class V SDKr Mutiara Kasih students through the application of learning using the demonstration method. Based on the analysis of learning results from the number of fifth grade students at Mutiara Kasih Elementary School, there were 16 students in the science and science learning material on Respiratory Organs. The average student score reached 84.75%. There were 14 students who got scores above the KKM with a percentage of 87.5%, and 2 students got scores below the KKM with a percentage of 12.5%. With the highest score of 100 and the lowest score of 64. This shows that student learning outcomes have improved by using the Jigsaw type cooperative learning model and Project Based Learning (PJBL).

This means that there is a significant influence in the experimental class using the Jigsaw type cooperative learning model on students' science learning outcomes on the subject of the human digestive system. Jigsaw type cooperative learning has a positive influence on learning (Putra et al., 2018), (Herawati & Irwandi, 2019), (Kasih et al., 2018), (Arini, 2016), (Huda & Arief, 2013). Jigsaw type cooperative learning that has been carried out can be used as a new learning experience for students by not only coming, sitting, taking notes on material and working on questions, but learning is done by forming home groups and then students are given the responsibility to look for material in expert groups. In learning like this, of course, the initial goal is to convey the material being taught

In the jigsaw learning model, students are not only required to learn individually, but also students are required to be able to work together in groups to achieve joint learning results, and students are also required to be responsible for the results of their group collaboration. According to Abdullah (2017), the jigsaw learning model can make students actively involved in ongoing learning and provide a pleasant atmosphere, so that students not only receive the material, but students will also not feel bored during the lesson. Meanwhile, according to Asep (2016), the jigsaw type cooperative model is a learning model that emphasizes responsibility both as a group and individually to be able to understand the material that students have studied so that they can be more active in learning related to the results of improving student learning.

The results of observations made by Nasriyati (2019) regarding the Application of the Jigsaw Type Cooperative Model in Human Digestive System Material to Improve Class VIII Student Learning Outcomes at SMP Negeri 4 Montasik Aceh Besar showed that the results of increased student learning in the first cycle showed that the number of students was as high as 11 people had a percentage of 68.75%, with a score in cycle II of 76.25 which was said to have increased student learning outcomes in the human digestive system material.

Meanwhile, according to Syamsiah (2011:6), through the application of the Jigsaw Type Cooperative Learning Model in Social Studies Learning at SDN Inpres 1

Tanamodindi, it is stated that there are several benefits for students to improve students' understanding and learning outcomes. For teachers as input to improve learning outcomes and for schools as input to improve the quality of learning in schools. In the opinion of Ardianto (2013) that Jigsaw Type Cooperatives can improve students' understanding of the learning material that has been taught in order to improve student learning outcomes. When learning takes place well between teachers and students, there will be learning support that can improve student learning outcomes.

5. CONCLUSION

Based on the findings and deliberation of the study conducted at SDKr Mutiara Kasih, it can be inferred that the demonstration learning approach has a significant impact on the academic achievements of fifth-grade students. The researchers observed a notable disparity in the influence of demonstration learning compared to traditional learning methods, specifically in the context of science subjects for fifth-grade students.

To further advance research in this area, it is recommended to devise a Cooperative learning model of the Jigsaw type. This model would involve incorporating diverse combinations of instructional models to create a comprehensive assessment of students' comprehension levels while engaging with the instructional content in the classroom.

The Jigsaw type of Cooperative learning model is particularly suitable for this research as it encourages active participation and collaboration among students. In this model, students are divided into small groups, and each group is assigned a specific topic or concept to become an expert on. They then share their knowledge with their peers in a cooperative manner, ensuring that each student gains a comprehensive understanding of the subject matter.

By implementing this Cooperative learning model, researchers can assess the impact of different combinations of instructional models on students' academic achievements. This approach will provide a more holistic understanding of how students learn and comprehend science subjects in the fifth grade.

Furthermore, incorporating diverse combinations of instructional models within the Jigsaw type of Cooperative learning will allow researchers to explore the effectiveness of various teaching strategies. For example, they can combine demonstration learning with other methods such as inquiry-based learning, problem-based learning, or project-based learning. This will enable a comprehensive evaluation of the different approaches and their impact on students' academic achievements.

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