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THE EFFECT OF THE JIGSAW-TYPE COOPERATIVE MODEL WITH THE ASSISTANCE OF PAIRED CARD MEDIA ON THE LEARNING OUTCOMES OF GRADE VII STUDENTS AT KRISTEN PAYETI JUNIOR HIGH SCHOOL

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Abstract
This study aims to determine the effect of the jigsaw-type cooperative model assisted by paired card media on the learning outcomes of class VII students on the interaction of living things with the environment at Payeti Christian Middle School. This type of research is an experiment using a pretest-posttest control group design, sampling using purposive sampling. The population in this study were all students of class VII IPA at Payeti Christian Middle School in the even semester of the 2022/2023 academic year. The sample of this research was 30 students of class VII C as the control class and 30 students of class VII B as the experimental class. The results of the descriptive analysis obtained showed that the pretest and posttest scores for the experimental class were 59.50 < 77.00 while the pretest and posttest scores for the control class were 45.50 < 72.97. Further testing the hypothesis using the paired sample t-test produces an Asymp value. Sig (2-tailed) 0.000 means that the value is less than 0.05 (< 0.05). It can be concluded that the jigsaw-type cooperative learning model assisted by paired card media affects learning outcomes.
Keywords: *Learning Model, Cooperative, Jigsaw, Paired Cards, Learning Outcomes*

Abstrak
Penelitian ini bertujuan untuk mengetahui pengaruh model kooperatif tipe jigsaw berbantuan media kartu berpasangan terhadap hasil belajar siswa kelas VII materi interaksi makhluk hidup dengan lingkungan di SMP Kristen Payeti. Jenis penelitian ini ialah eksperimen menggunakan desain pretest-posttest control group design, Pengambilan sampel menggunakan purposive sampling. Populasi dalam penelitian ini seluruh siswa kelas VII IPA di SMP Kristen Payeti pada semester genap tahun ajaran 2022/2023. Sampel penelitian ini yaitu 30 siswa kelas VII C sebagai kelas kontrol dan 30 siswa kelas VII B sebagai kelas eksperimen. Hasil analisis deskriptif yang diperoleh menunjukkan bahwa nilai pretest dan posttest kelas eksperimen 59.50 < 77.00 sedangkan nilai pretest dan posttest kelas kontrol 45.50 < 72.97. Lebih lanjut pengujian hipotesis menggunakan uji paired sample t test menghasilkan nilai Asymp. Sig (2-tailed) 0,000 artinya nilai tersebut kurang dari 0,05 (< 0,05). Dapat disimpulkan bahwa model pembelajaran kooperatif tipe jigsaw berbantuan media kartu berpasangan berpengaruh terhadap hasil belajar.
Kata Kunci: Model Pembelajaran, Kooperatif, Jigsaw, Kartu Berpasangan, Hasil Belajar

INTRODUCTION

Education is a process by which a person develops his qualities to have a positive impact on himself and his environment. Learning is a process of acquiring knowledge, and it is a process of long-term change in responseability after intensive training (Rustam et al., 2023). Education is the process of changing a person's character or behavior to improve himself through education and training (Handayani & Arifin, 2022). Education is an important pillar in building a quality nation (Putra et al., 2018). Because education plays a very important role in the growth and improvement of the quality of a nation, we hope that a world with a high level of education can support a generation that is skilled, wise, and open. (Nawahdani et al., 2022).

Jigsaw is a collaborative learning structure with many uses. Although Jigsaw can be utilized for a variety of purposes, its main use is for presenting and acquiring new information because of its interdependence. Useful learning of the Jigsaw type is a learning strategy for the preparation of practical multi-group learning that can be used for all subjects and all levels to develop the mastery and abilities of each group (Lubis & Harahap, 2016). Jigsaw-type cooperative learning is a learning model that requires students to be responsible for their respective tasks and pass them on to other group members, thus enabling them to understand each other among other students. In terms of the concepts studied using this model contain more theoretical aspects than formulas or equations in the material being taught, so students are required to first understand the material that will be used as the basis of their knowledge (Kahar et al., 2020). Learning activities must be developed to provide learning experiences that involve mind-body processes through interactions between students, educators, the environment, and other learning resources to acquire basic competencies and improve learning outcomes(Widarta, 2020).

Based on the results of interviews with science teachers (JP) at Payeti Christian Middle School Jl. on August 30, 2022. Umbu Rara Meha No. 31, Prailiu, Kambera District, East Sumba Regency, East Nusa Tenggara Province, As is known in the teacher's class, the learning process relies more on discovery learning models to convey information and lacks media creativity. There are still some students in the science learning process who are less interested in the subject. Some play alone, talk with their peers and do homework for other subjects. Because the teacher is also the center of learning, student participation in asking questions is not optimal, and some students do not try to answer questions from the teacher. Based on the results of the class VII science midterm exam, 54% of students did not pass, and only 46% passed the KKM with a score of 70.

Seeing the low science achievement of SMP Kristen Payeti among its class VII students, teaching is needed that can improve student learning outcomes that are less than optimal. Learning models play an important role in learning to broaden and deepen the material and make it easier for teachers to communicate the material presented. The learning model is an attempt to implement plans that have been prepared in practical activities to achieve the planned goals optimally (Lokat et al., 2022). The jigsaw cooperative learning model can be used. Students are encouraged to become active participants in jigsaw-type cooperative learning, which involves working together to master the material. Cooperative learning becomes relevant for students as a result of the activities that have been carried out and can be used to enhance group collaboration (Rahman Jarre et al., 2017). Jigsaw cooperative learning is a learning strategy that can help students communicate effectively, create an active learning environment, and achieve satisfactory learning outcomes.

In this study, the learning model applied is supported by the use of paired card media. This is considered appropriate or suitable for use in class VII SMP Kristen Payeti to determine student learning outcomes because the purpose of this learning model is to help students to be more able to think critically and express their ideas.

Therefore, it is hoped that various learning models and media can be used to create an effective, interesting, and fun learning environment for students to achieve learning outcomes. The scope of the subject matter to be taught must also be considered when choosing a learning model. To ensure that students remember and understand all information, an interesting and appropriate learning model is needed (Djamarah, 2010:140). In addition, students are expected to have an interesting learning experience when using game media to understand a concept, reinforce previously understood concepts, or solve problems. Paired card game media is one of the game media that can help in the process of strengthening learning material.

Previous research was conducted by (Aprilia et al., 2018: 68). Previously it was shown that regarding the curriculum-based jigsaw learning model implemented in 2013, the results obtained indicated that this model had the potential to improve student learning outcomes. In the pre-cycle stage, the proportion of students whose learning outcomes had reached the KKM was 42.86 percent, but after the implementation of the first cycle, the proportion of students who had achieved the KKM increased by 71.42 percent, and after the implementation of the first cycle, the proportion of students who achieved the KKM increased by 71. 42 percent. the second cycle, the proportion of students who have achieved KKM increased. The findings of research conducted by (Hastuti, 2019: 121) showed that the development of paired card media on the biology craft discussion tree (organism classification) is feasible to use as a general biology learning medium based on the results of two rounds of validation by media experts, with an overall percentage reaching 89.0% (criterion "very good").

At the evaluation stage of the learning process, this paired card media will be used to assist students in consolidating information or ideas they receive from discussions with the jigsaw-type cooperative learning model. The benefits of this research are expected to be able to provide scientific input in the learning process at school about the influence of the cooperative jigsaw model assisted by paired card media. For teachers, this research is expected to be used as input material for teachers in teaching so they can develop learning models and media in improving student learning outcomes.

The scope of this research is limited to (1) The learning material used is the interaction of living things with the environment with basic competencies, namely: 3.5 Analyzing the interactions between living things and their environment. The learning outcomes of students in class VII B and class VII C in the even semester of the 2022/2023 academic year at Payeti Christian Middle School are in the cognitive domain. The sampling withdrawal technique uses purposive sampling. This type of experimental research with a quantitative approach.

RESEARCH METHODS

This research was conducted in the even semester of the 2022/2023 academic year in January 2023 which took place at the Payeti Christian Middle School in Waingapu, East Sumba, Indonesia. The population in this study was 60 grade VII students divided into 2 classes in the even semester of the 2022/2023 school year. The sample in this study was class VII B, which consisted of 30 students in the experimental class and 30 students in class VII C as the control class. The sampling technique uses a purposive sampling technique or a purposive sample. In the material on the interaction of living things with the environment with basic competencies (KD), namely: 3.5 Analyzing the interactions between living things and their environment.

This study used an experimental approach with a pretest-posttest control group design. Given two tests, pretest and posttest. The pretest was given before the treatment to ensure the condition of the group before receiving treatment, and the posttest was given after treatment. The type of data used in this study is quantitative data on student learning outcomes collected through the use of pre-test and post-test multiple-choice tests on test sheets. Pretest and post-test data obtained in this study were analyzed including; Validity test and reliability test, the Normality test with Shapiro-Wilk, Homogeneity Based on Mean value, and hypothesis testing with paired sample t-test with a significance level of 0.05.

HASIL DAN PEMBAHASAN

Following are the results of the SPSS 22 data analysis on the learning outcomes of Payeti Christian Middle School students:

Table 1. Pretest results of the control and experimental classes

Data	Pretest results	
	control	experiment
Min value	20	30
Maximum value	80	95
Mean	45.50	59.50
Standard deviation	17.82	15.88
complete	5 (17%)	12 (40%)
Not finished	25 (83%)	18 (60%)

Based on table 1, the results of the first test without the jigsaw cooperative learning model show that the average of the two classes above is still low because they are below the KKM, which is below the score of 70.

Table 2. Posttest results for the control class and the experimental class

Data	Posttest results	
	Control	Experiment
Min value	50	60
Maximum value	95	100
Mean	72.97	77.00
Standard deviation	11.64	10.47
complete	19 (63%)	26 (87%)
Not finished	11 (37%)	4 (13%)

Based on table 2, the results of the second posttest test conducted after the application of the jigsaw cooperative learning model showed that experimental class students had better learning outcomes than control class students, with scores that exceeded the KKM limit, such as an average of 77.00 in the experimental class.

Table 3. Test the validity of the pretest questions

No Soal	Sig (2-Tailed)	Keterangan	Kesimpulan
1.	0,000	< 0,05	Valid
2.	0,113	> 0,05	Tidak valid
3.	0,000	< 0,05	Valid
4.	0,749	> 0,05	Tidak valid
5.	0,000	< 0.05	Valid
6.	0.962	> 0.05	Invalid
7.	0.000	< 0.05	Valid
8.	0.000	< 0.05	Valid
9.	0.010	< 0.05	Valid
10.	0.000	< 0.05	Valid
11.	0.906	> 0.05	Invalid
12.	0.687	> 0.05	Invalid
13.	0.000	< 0.05	Valid
14.	0.090	> 0.05	Invalid
15.	0.000	< 0.05	Valid

Based on the table above, it can be concluded that there are 9 valid questions and 6 invalid questions. The questions above which were declared valid were questions number 1, 3, 5, 7, 8, 9, 10, 13, and 15 while the invalid questions were questions number 2, 4, 6, 11, 12, 14.

b. Pretest Reliability Test

Table 4. The results of the reliability test of pretest questions

Reliability Statistics	
Cronbach's Alpha	N of Items
.877	15

Cronbach's alpha value is 0.877, meaning more than 0.07, so it can be concluded that the data is reliable.

Table 5. Test the validity and reliability of the post-test questions

No. Question	Sig (2-Tailed)	Information	Conclusion
1.	0.000	< 0.05	Valid
2.	0.828	> 0.05	Invalid
3.	0.000	< 0.05	Valid
4.	0.100	> 0.05	Invalid
5.	0.088	> 0.05	Invalid
6.	0.000	< 0.05	Valid
7.	0.003	< 0.05	Valid
8.	0.549	> 0.05	Invalid
9.	0.000	< 0.05	Valid
10.	0.003	< 0.05	Valid
11.	0.056	< 0.05	Invalid
12.	0.000	< 0.05	Valid
13.	0.167	> 0.05	Invalid
14.	0.003	< 0.05	Valid
15.	0.000	< 0.05	Valid
16.	0.000	< 0.05	Valid
17.	0.364	> 0.05	Invalid
18.	0.000	< 0.05	Valid
19.	0.000	< 0.05	Valid
20.	0.000	< 0.05	Valid

Based on the table above, it can be concluded that there are 13 valid questions and 7 invalid questions. The questions above which were declared valid were questions number 1, 3, 6, 7, 9, 10, 12, 14, 15, 16, 18, 19, and 20 while invalid questions were questions number 2, 4, 5, 8, 11, 13, 17.

b. Reliability test

Table 6. Reliability test results for post-test questions

Reliability Statistics	
Cronbach's Alpha	N of Items
.919	20

Cronbach's alpha value is 0.919, meaning more than 0.07, which means the data is reliable.

Table 7. Normality Test

Statistics	Pretest		Postest	
	Control	Experiment	Control	Experiment
Sig (2-tailed)	0.039		0.197	
sig level		0.05		
Conclusion	Normal		Normal	

Based on the table above, experimental and control class data as well as pretest and posttest data show a *Shapiro-Wilk Sig value of* >0.05. It can be concluded that the data is normally distributed.

Table 8. Homogeneity Test

Statistics	*Pretest*		*Posttest*	
	Control	Experiment	control	Experiment
Sig (2-tailed)		0.554		
sig level		0.05		
Conclusion	Both data are homogeneous			

Based on table 8 it is known that for homogeneity calculations the sig value is 0.554. The homogeneity calculation shows that the value obtained is > 0.05, meaning that the variance of the data groups is the same.

Table 9. Test *paired sample t-test*

Statistics	Pretest		Posttest	
	Control	Experiment	control	Experiment
Sig (2- *tailed*)	0.000		0.000	
Sig level	0.05			
Conclusion	0.000 <0.05 so Ho is rejected and H1 is accepted			

The results of *the paired sample t-test* for the experimental class above, the *sig* (2-tailed) value is 0.000, meaning the sig value <0.05. So it can be concluded that Ho is rejected and H1 is accepted, meaning that there is an effect of using the *jigsaw-type cooperative learning model* assisted by paired card media on learning outcomes.

Discussion

The results showed that students in the experimental and control classes had relatively low initial abilities. the same thing was found (Wanda et al., 2023:129). Before carrying out learning activities, a pretest is carried out using a multiple choice test of 15 numbers. The pretest is carried out to find out the student's initial knowledge and at the end of the lesson, they will be given 20 multiple-choice posttest questions. Posttest is also conducted to determine student learning outcomes after participating in learning. In the experimental class, learning was carried out using a jigsaw-type cooperative learning model assisted by paired card media. While the control class uses the Discovery Learning learning model without using learning media.

Based on the results of data analysis in table 1, it is known that the control class got an average pretest score of 45.50 with the highest score of 80 and the lowest score of 20 while the average post-test score was 72.97 with the highest score of 95 and the lowest score of 50. In the experimental class, the score pretest average was 59.50 with a highest score of 95 and the lowest score of 30, while the posttest average score was 77.00 with the highest score of 100 and the lowest score of 60. Based on the results of the elaboration of the pretest and posttest data for both the control class and the experimental class it can be concluded that learning using the jigsaw-type cooperative model assisted by paired card media has a fairly good effectiveness compared to learning without using the jigsaw type cooperative model assisted by paired card media. For this reason, it can be seen from the results of the calculation of the mean posttest value in the experimental class which is higher, namely 77.00, while the average value of the control class is 72.97.

Based on the analysis of the 15 pretest item numbers using SPSS, 9 valid item numbers and 6 invalid item numbers (Table 3). The post-test questions totaled 20 question numbers, 13 valid question numbers, and 7 invalid question numbers (Table 5). According to (Widoyoko, 2018:232) If the instrument can measure exactly what needs to be measured, then the instrument is said to be valid. In other words, the accuracy of the measurement instrument is related to validity. A valid instrument will also produce valid data, or it can be said that the instrument itself is valid if the data it produces is valid. According to (Nazaruddin & Basuki, 2015:17) The item analysis aims to determine the degree of relevance of the questions used as an assessment. Furthermore, testing the reliability of the pretest and posttest items using SPSS, the pretest items were known to have Cronbach's alpha value of 0.877 (Table 4), and the posttest items were known to have Cronbach's alpha value of 0.919 (Table 6) meaning that the Cronbach's alpha value pretest and posttest were >0.07 so that it could be concluded that the data the pretest and posttest questions are reliable. According to (Setyosari, 2016:237) reliable means trustworthy. If the measurement results (scores of the group being tested) are consistent or constant, then the test is said to be reliable. Unshakable quality also denotes the lowest test rate. The data itself, not just the instruments used to collect it, is the most important factor.

Furthermore, the test used to determine whether a hypothesis is accepted or rejected is the paired sample t-test, but the normality and homogeneity tests are carried out before carrying out the testing. According to (Sugiyono, 2015:241) the normality test was carried out using the Shapiro Wilk because it aims to check

whether the sample comes from a normally distributed population. The normal distribution is a perfectly symmetrical distribution or distribution of the average score. The results of the normality test (table 7) show a posttest sig (0.204) for the experimental class and a posttest sig (0.197) for the control class. In line with research (Wanda et al., 2023:19) Both sample classes are normally distributed because sig is greater than alpha (α = 0.05) for the experimental class and the control class. Then a homogeneity test was carried out to see whether the data was homogeneous or vice versa. The scores are easiest to compare parametrically when the two groups are the same (homogeneous). If the two groups tested show the same average but the distribution is different, then the parametric test will be difficult to interpret because of differences in the distribution or variance within the groups. (Setyosari, 2016:254). The results of the homogeneity test with the SPSS program (table 8) show a value based on the mean of 0.556. Based on the sig value, the data is homogeneous because the significance value is greater than the alpha value (α = 0.05), meaning that the variance of the data groups is the same. The research results are in line with (Rihi & Bano, 2022:186).

Furthermore, the results of the paired sample t-test hypothesis (table 9) post-test data for the experimental class obtained a sig (2-tailed) value of 0.000 with a significance level of 0.05. So that the value of sig (2-tailed) < 0.05, it can be concluded that Ho is rejected and H1 is accepted, meaning that the use of the jigsaw-type cooperative model assisted by paired card media influences the learning outcomes of class VII students on the interaction material of living things with their environment in Christian Middle Schools sequins. This is supported by research conducted by(Fatubun et al., 2022) that there is an influence of the jigsaw-type cooperative learning model that can give increase student learning outcomes as evidenced by the average score of the test results of the experimental class and the control class. So that students can understand each other among other students, the jigsaw-type cooperative learning model requires that each student is responsible for his work and does not involve other group members (Mikrayanti, 2020). The same thing was also stated by (Wanda et al., 2023) that the cooperative learning model influences students' cognitive learning outcomes. Students are required to take part in activities such as forming home groups, and expert groups, and playing paired cards when using a jigsaw cooperative model supported by paired card media. However, students still form groups and play according to the teacher's instructions. As shown in table 2, the posttest learning outcomes of the experimental class were able to adapt well from time to time; so that at meeting 2, even though they did not receive any instructions, they were able to play cards in pairs or form groups effectively increasing the average student learning outcomes. supported by research findings (Melivicasari et al., 2020:98) namely the influence of the cooperative model of the jigsaw type assisted by paired card media has a significant effect on students' cognitive learning outcomes.

jigsaw-type cooperative learning model assisted by paired card media involves students directly so that learning becomes more fun and communicative. Students can make every effort to understand the material they are working on because of the responsibility of the home group to gather information. During the evaluation of learning, paired card media can also encourage students to try to understand other material presented by group members. as many of these students make learning very interesting, fun, and meaningful so that students better understand what they learn.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that the cooperative model of the *jigsaw type* assisted by paired card media affects the learning outcomes of class VII students at Christian Payeti Middle School, which can be shown from the results of the *paired sample t-test* which has a *sig (2-tailed) value* of 0.000, meaning that the value less than 0.05 so that Ho is rejected and H1 is accepted**.**

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