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THE EFFECT OF THE JIGSAW TYPE COOPERATIVE LEARNING MODEL ON THE LEARNING OUTCOMES OF CLASS VIII STUDENTS AT SMP NEGERI 2 WAINGAPU

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Abstract
This study aims to see the impact of the Jigsaw Cooperative Learning Model on the Learning Outcomes of Grade VIII Students at SMP Negeri 2 Waingapu. This type of research is a quasi-experimental research design using nonequivalent control group design. Collection of samples using purposive sampling. The research population is class VIIIE students at SMP Negeri 2 Waingapu in the odd semester of 2022/2023. The sample of this research is 32 students of class VIIIE as the experimental class. The descriptive results obtained proved that the pretest and posttest scores for the experimental class were 69.19 < 76.28 while the pretest and posttest scores for the control class were 63.50 < 69.56. Furthermore, the hypothesis experiment 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 interpreted that the Jigsaw type cooperative learning model has an influence on learning outcomes.

Keywords: *Cooperative Learning, Jigsaw Type, Learning Outcomes*

Abstrak
Penelitian tersebut bertujuan melihat dampak dari bentukl Pembelajaran Kooperatif Tipe Jigsaw Terhadap Hasil Belajar Siswa Kelas VIII di SMP Negeri 2 Waingapu. Ragam riset ini merupakan kuasi percobaan menggunakan desain penelitian nonequivalent control group design. Pengumpulan contoh menggunakan purposive sampling. Populasi riset ini merupakan siswa kelas VIIIE di SMP Negeri 2 Waingapu pada semester ganjil 2022/2023. Sampel penelitian ini yaitu 32 siswa kelas VIIIE sebagai kelas percobaan. Hasil penjabaran deskriptif yang didapat membuktikan bahwa nilai pretest dan posttest kelas percobaan 69,19 < 76,28 sedangkan nilai pretest dan posttest kelas kontrol 63,50 < 69,56. Lebih lanjut percobaan hipotesis menerapkan uji paired sample t-test menghasilkan nilai Asymp. Sig (2-tailed) 0,000 artinya nilai tersebut kurang dari 0,05 (< 0,05). Disimpulkan model pembelajaran kooperatif tipe Jigsaw memiliki efek kepada hasil belajar.

Kata kunci: Pembelajara Kooperatif, Tipe Jigsaw, Hasil Belajar

INTRODUCTION

In accordance with community values, education is an effort to maximize innate potential to grow and develop both physically and spiritually (Yuristia, 2018: 2). An important component of successful teaching and learning is improving formal teaching standards in schools. Instructors are the most important interrelated factors that influence how teachers, students, learning models are all involved in the teaching and learning process (Wondal & Djamrud, 2014: 293). The learning approach called cooperative learning places a strong emphasis on students working together. Jigsaw cooperative learning

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can motivate students to actively participate and support each other in understanding the topic in order to realize their highest potential (Kikot et al., 2012: 1).

Based on interviews on November 17, 2022, which the researchers conducted with science educators for class VIII at SMP N 2 Waingapu, the learning process was not effective, where the model that was often used was the Discovery Learning model, but the progress of students in working groups and when given the opportunity to ask questions, students often remain silent even when the teacher asks questions. Student learning outcomes will appear in the odd midterm assessment (PTS) in 2022/2023 which is not optimal, obtained data on student learning outcomes under the KKM with the learning assessment standard for class VIII is 71. Based on the results of Odd PTS in science class VIII, the majority of the 32 students are still have poor learning outcomes. Of the 12 students who got a complete score, namely the percentage of 37.5% and not reached as many as 20, namely the percentage of 62.5%.

Based on these problems, it is necessary to have interesting learning innovations, make students active and not bored and cultivate relationships with other students, therefore it is not balanced between students who can and cannot. One of the changes made was establishing a jigsaw type cooperative model. This cooperative learning is a learning activity that can increase student activity and learning outcomes. Student-centered learning activities include discussions, doing assignments together and helping each other. Jigsaw is one of the cooperative learning models. Cooperative jigsaw type is a cooperative learning model consisting of several groups in which each group has responsibility for certain material and is able to teach that part to other group members (Nasruddin, N., & Abidin, Z. 2017: 114).

Jigsaw is a cooperative learning approach that emphasizes small component collaboration. The stages of jigsaw type cooperative learning according to Lestari & Yudhanegra (2018:48-49) are as follows:

1) Separating learning topics into five to six parts. Each group member chooses the part that is under his authority.
2) The group whose topic is the same as the other groups, joins in a new group called the expert group to discuss the topic which is their responsibility in recording important points in the topic.
3) The teacher supervises learning activities in each group and gives instructions to the chairman in helping each friend who has difficulty explaining his part.
4) To assess student understanding, the teacher held a quiz.

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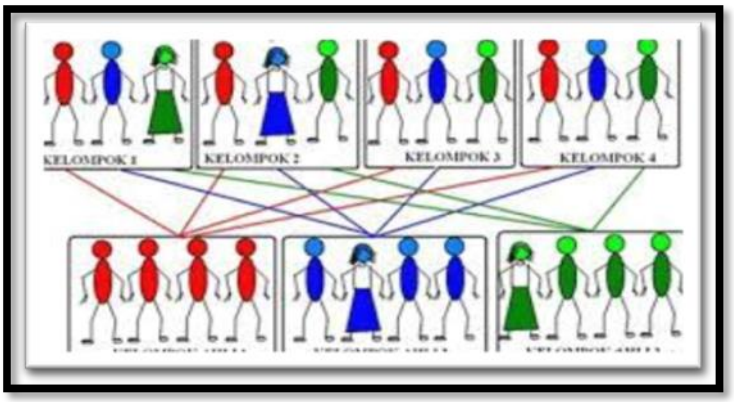

Figure 1. Cooperative learning type *jigsaw*

According to Abdullah, R (2017:24-25) the jigsaw cooperative education model is inseparable from advantages and disadvantages.

1. Excellence
   a) Can encourage students to collaborate and be eager to learn.
   b) Encouraging learning motivation in a classroom where students respect each other.
2. Trouble
   a) This can be challenging because friends may have different understandings of the same topic, so a teacher's supervision situation is absolutely necessary to prevent mistakes.
   b) If students lack confidence, it will be difficult to invite students to discuss sharing material with their friends.

Research related to the jigsaw type cooperative model conducted by previous researchers, the jigsaw type cooperative learning model is able to increase student learning outcomes, including Rosyidah's research (2016) entitled The Influence of the Jigsaw Type Cooperative Model on Mathematics Learning Outcomes in Grade VIII Students of SMP N 6 Metro, learning outcomes after the treatment of the Jigsaw cooperative model, the results of the pretest and posttest were obtained, namely students who reached KKM 70, the pretest of students who completed were 25% or 7 students, while those who had not completed were 75% or 21 students. In the posttest, 92.86% or 26 students completed the test, while 7.14% or 2 students did not complete it. The total pretest result is 1794 while the posttest result is 2252. The average pretest result is 64.07 and the average posttest is 80.43.

The excretory system with basic competencies, namely: 3.9 Analyzing the excretory system in humans and understanding disorders of the excretory system and maintaining the health of the excretory system is the scope. The results of VIII A and VIII E for the 2022/2023 school year at SMP Negeri 2

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Waingapu are in the cognitive domain. The sampling technique used was purposive sampling. Variety of experimental research with a quantitative approach.

Based on the background of the problem, the researcher is interested in conducting research with the title "The Influence of the Cross-Jigsaw Cooperative Learning Model on the Learning Outcomes of Grade VIII Students at SMP Negeri 2 Waingapu". The goal to be achieved from this research is to determine the effect of the jigsaw cooperative learning model on the learning outcomes of class VIII students at SMP Negeri 2 Waingapu.

RESEARCH METHODS

This in-depth study was held in the even semester of 2022/2023 in February 2023 which took place at SMP Negeri 2 Waingapu, East Sumba. The research population was 64 students of class VIII which were divided into two classes. An example of this research is class VIII A with 32 students as the control class and 32 students in class VIII E as the experimental class. On excretory system material, namely: 3.9 Analyzing the excretory system in humans and understanding disorders of the excretory system and maintaining the health of the excretory system.

This research uses the approach carried out to find out whether there is a correlation or impact of the independent variables on the dependent variable (Hasanah, 2021: 136). This study uses quasi-experiments. The design of this study uses a nonequivalent control group design, as shown in table 1.

Table 1. Research design

Group	*Pretest*	Treatment	*posttest*
E	O_1	X	O_2
K	O_3	-	O_4

This research uses a descriptive approach with question and answer methods, discussions, experiments, and assignments. The data technique in this study uses the SPSS 22 application. The aim of the validity test is to know that reliability and validity measure the same aspect. Conversely, the reliability test is carried out in order to find out how consistent the measurement is ((Nazaruddin & Basuki, 2015). It is said to be validity if the significance value is 0.05 (<0.05 = valid), while the reliability test is if Cronbach's alpha > 0.07 is reliable) . The pre-test and post-test data that were obtained in this study were analyzed; Normality test with Shapiro-Wilk, Homogeneity with Values based on the Mean, and Hypothesis test with Paired T test with a significance level of 0.05.

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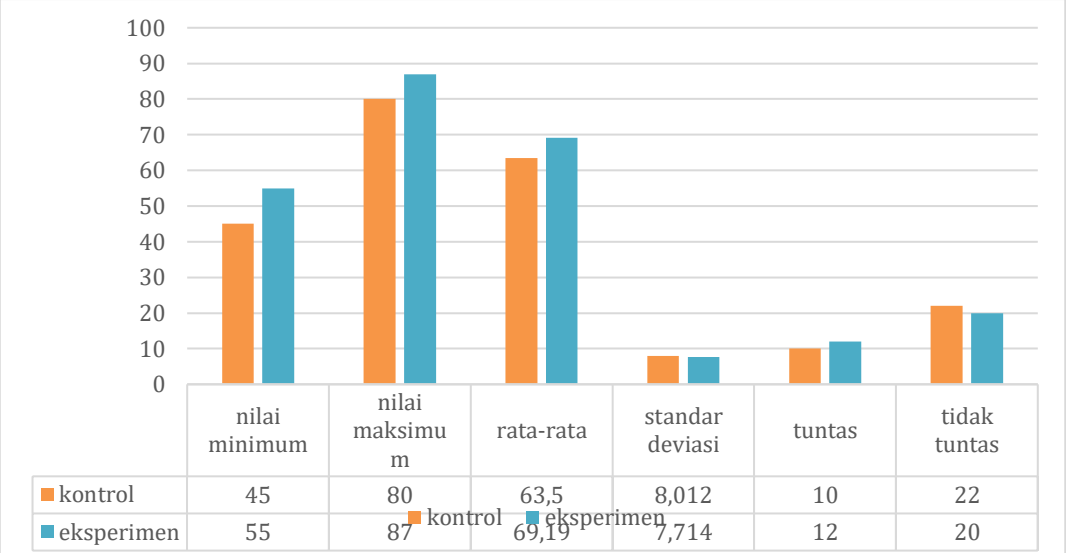
RESULTS

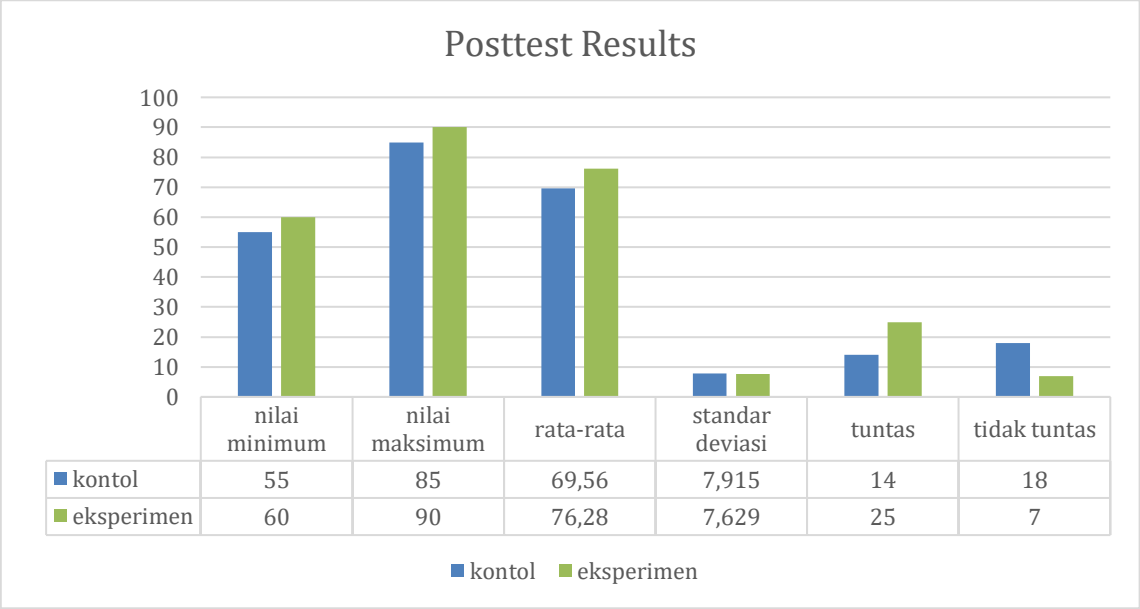
Following are the results of the analysis of the SPSS 22 application data on the results obtained by students at SMP Negeri 2 Waingapu:

Tablel 2. Pretest



	nilai minimum	nilai maksimum	rata-rata	standar deviasi	tuntas	tidak tuntas
kontrol	45	80	63,5	8,012	10	22
eksperimen	55	87	69,19	7,714	12	20

Table 3. Posttest



	nilai minimum	nilai maksimum	rata-rata	standar deviasi	tuntas	tidak tuntas
kontol	55	85	69,56	7,915	14	18
eksperimen	60	90	76,28	7,629	25	7

Based on the table above, it is known that the mean pretest score for the control class was 63.50, the minimum score was 45, and the maximum score was 80. Furthermore, 10 students who completed were students while 22 students did not complete. Then for the posttest mean value of the control class is 69.56,

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the minimum score is 55 and the maximum score is 85. In addition, there are 14, 18 students. Furthermore, the data analysis of the experimental class found that the mean pretest was 69.19, the minimum score was 55 and the maximum score was 87. The number of students who completed was 12 students and the number of students who did not complete was 20 students. In addition, the mean value of the posttest for the experimental class was 76.28, the minimum score was 60 and the maximum was 90. There were 25 students who passed, 7 students had not yet reached the KKM. Based on these values, we can see that the experimental class shows a greater increase in learning outcomes than the control class.

Table 4. Results of the validity test of pre test questions

Question Number	Sig. (2-tailed)	data	provision
1	0,599	> 0,05	Invalid
2	0,000	< 0,05	Valid
3	0,003	< 0,05	Valid
4	0,003	< 0,05	Valid
5	0,009	< 0,05	Valid
6	0,003	< 0,05	Valid
7	0,135	> 0,05	Invalid
8	0,001	< 0,05	Valid
9	0,000	< 0,05	Valid
10	0,000	< 0,05	Valid
11	0,000	< 0,05	Valid
12	0,000	< 0,05	Valid
13	0,000	< 0,05	Valid
14	0,001	< 0,05	Valid
15	0,001	< 0,05	Valid

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

Table 5. Reliability test results for pre test questions

Cronbach's Alpha	N of Items
.839	15

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The conclusion from Cronbach's Alpha value of 0.839 is greater than 0.07.

Table 6. Results of the validity test of the post test question

Question Number	Sig. (2-tailed)	data	provision
1	0,400	> 0,05	Invalid
2	0,001	< 0,05	Valid
3	0,001	< 0,05	Valid
4	0,035	< 0,05	Valid
5	0,019	< 0,05	Valid
6	0,090	< 0,05	Valid
7	0,233	> 0,05	Invalid
8	0,001	< 0,05	Valid
9	0,000	< 0,05	Valid
10	0,000	< 0,05	Valid
11	0,000	< 0,05	Valid
12	0,000	< 0,05	Valid
13	0,000	< 0,05	Valid
14	0,000	< 0,05	Valid
15	0,000	< 0,05	Valid
16	0,000	< 0,05	Valid
17	0,000	< 0,05	Valid
18	0,000	< 0,05	Valid
19	0,000	< 0,05	Valid
20	0,000	< 0,05	Valid

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

Table 7. The results of the reliability test of the post test questions

Reliability Statistics	
Cronbach's Alpha	N of Items
.881	20

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The conclusion from Cronbach's Alpha value of 0.881 is greater than 0.07.

Table 8. results

	Control Class		Class Experiment	
	Pretest	Postest	Pretest	Posttest
Sig	0,483 > 0,005	0,297 > 0,05	0,211 > 0,05	0,132 > 0,05
provision	Normal	Normal	Normal	Normal

Pre test and post test data showed Shapiro-Wilk Sig > 0.05. It is concluded that the data is normally distributed.

Table 9. Homogeneity results

Test of Homogeneity of Variance					
		Levene Statistic	df1	df2	Sig.
Student Study results	Based on Mean	,069	1	62	,793
	Based on Median	,033	1	62	,857
	Based on Median and with adjusted df	,033	1	61,954	,857
	Based on trimmed mean	,069	1	62	,793

Based on the table above, the value based on mean is 0.793 > 0.05, it can be concluded that the data is homogeneous.

Table 10. Test *paired sample t-test*

Paired Sample T-Test			
Class	Df	Sig. (2-tailed)	Conclusion
Experiment	31	0,000	Influential

Pretest and post test data showed Shapiro-Wilk Sig > 0.05. It is concluded that the data is normally distributed.

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DISCUSSION

Based on the results of the research, it was shown control class and experimental class. Using 15 multiple choice questions, the pre test is given before the start of learning activities. The pre test is used to determine students' prior knowledge, and 20 multiple choice post test questions will be given to them at the end of the lesson. After students participate in learning activities, they are given a post test for their results. The Jigsaw model was used for the experiment and the control class was implemented with Discovery Learning.

Based on the results of the study of control class data, it was found that the mean pre test was 63.50, the minimum score was 45 and the maximum score was 80. Furthermore, 10 students achieved KKM while 22 students did not complete. Then for the posttest mean value of the control class is 69.56, the minimum score is 55 and the maximum score is 85. In addition, number of students who complete is 14 students while those who do not complete are 18 students. So, the findings in the control class show that the learning process is less effective because the teacher only uses books as a guide in conveying material. According to Nurwidayanti & Mukminan (2018) conventional media tends to demonstrate verbally, in other words, the teacher is a presenter of the subject matter as well as a mediator so that it has an impact on the level of students' understanding of the material to be taught.

Based on descriptive data (tables 2 and 3), the highest post test score is 85 and the lowest is 55; post test value 69.56. The pre test s for the control class was 63.50, with scores ranging from 45 to 80. The average pre test score for the experimental class was 69.19, the highest score was 87 and the lowest was 55. The post test had a maximum score of 90 and a minimum score of 60. A typical post test result was 76 ,28. Jigsaw is said to be more effective than learning without the Jigsaw model. The result of the analysis is 76.28 compared to 69.56. This is also adjusted to Abdullah's research (2017) which shows that jigsaw style classes perform better than conventional classes in terms of learning.

Based on the 15 number pre-test questions using SPSS, 13 were valid and 2 were invalid (chart 4). Post test questions with a total of 20 question numbers, 18 valid question numbers and 2 invalid question numbers (chart 6). For Widoyoko, (2018) it is said to be valid if it can measure the target object correctly. In addition, by using SPSS, to test the validity of the pre-test and post-test questions, the Cronbach's Alpha value was 0.839 (Table 5) and the post-test questions showed that the Cronbach's Alpha value was 0.881 (Table 7) meaning that the Cronbach's Alpha value pretest and posttest > 0.07 so that the data the pretest and posttest questions are reliable. According to Setyosari, (2016) reliable is trustworthy. A test is said to be reliable if the measurements (scores from the tested group) that are carried out show consistency

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or constancy. Reliability also indicates the level of reliability of a test, it is important that what is reliable is the data and not merely the data retrieval tool.

Acceptance or rejection of a hypothesis can also be determined by paired sample t-test. According to Tyastirin & Hidayanti (2017) the Shapiro-Wilk test is used for the normality test used to find out the sample comes from a normally distributed population. A perfectly symmetrical mean score is called a normal distribution. The results of the normality test (Table 8) showed that the posttest sig for the experimental class was 0.132 and the sig posttest for the control class was 0.297. When the variances or distributions within the two groups are the same, parametric comparison of the scores becomes easier.

In addition, the paired sample t test hypothesis test (chart 10) posttest experimental class data obtained a sig (2-tailed) value of 0.000 with a significant level of 0.05 concluded that H0 is rejected and H1 is accepted, meaning that it can affect the use of the jigsaw cooperative model on student learning outcomes on excretory system material in humans at SMP Negeri 2 Waingapu. These results are in line with research conducted by Waci & Nuryana (2020) which revealed that the jigsaw type of cooperative learning has an influence on students' cognitive learning outcomes. According Ardianto (2013) explains how Jigsaw cooperative learning outperforms conventional teaching techniques on student grades. Benu, (2019) found that the Jigsaw model for students has a greater impact on learning outcomes.

Based explanation above, jigsaw model has an influence on values that encourage students to participate actively in class while mingling well with teachers and friends. With this cooperative model, students play while learning by providing insight into the subject besides being more active learners. This shows how students' involvement in learning is more active when the teacher uses a jigsaw cooperative model.

CONCLUSION

The jigsaw-assisted model has an effect on grade VIII students' grades at SMP N 2 Waingapu in terms of conversational examination. This was shown in the post test control class was 63.50 and 69.56, while the experimental class was 69.19 and 76.28 respectively. The consequence of the t-test of a suitable sample shows that H0 is rejected and H1 is recognized as having a value below 0.05 indicated by the sig test (2-followed) with a value of 0.000.

REFERENCES

Abdullah, R. (2017). The Effect of Applying the Jigsaw Cooperative Learning Model to Chemistry Subjects at Madrasah Aliyah.Lantanida Journal, 5(1), 13. https://doi.org/10.22373/lj.v5i1.2056

Ardiyanto, A. (2013). The Effectiveness of Applying the Jigsaw Cooperative Model to Student Achievement in Accounting Subject at SMA Negeri 2 Karanganyar Academic Year 2011/2012.

Benu, J. J. (2019). Efforts to Improve Student Learning Outcomes in Grade IV Through the Application of a Role Playing Learning Model with the Concept of Crossing the Teberau Sea with God. Journal of Educational Sciences, 4(1).

Harahap, RD. (2018). Penerapan Model Pembelajaran Siklus Belajar (Learning Cycle) Dalam Meningkatkan Hasil Belajar Siswa Pada Mata Pelajaran Ipa Kelas Viii Smp N 1 Silangkitang. Jurnal Eduscience. DOI: https://doi.org/10.36987/jes.v5i2.938

Hasanah, Z. (2021). Cooperative Learning Models in Growing Student Learning Activeness.Student Studies, 1(1), 1–13.

Nasruddin, N. Z. A. (2017). Improving Mathematics Learning Outcomes Through the Jigsaw Type Cooperative Learning Model for SM Students.AKSIOMA: Journal of Mathematics and Mathematics Education, 3(2), 113–121. https://doi.org/10.26877/aks.v9i2.2839

Lestari, K. E & Yudhanegara, M. R. (2018).Mathematics Education Research. Bandung: Refika ADITAMA. Nurulfajri, N. (2016). The Effect of Crossword Puzzle Learning Media on Biology Learning Activities and Outcomes.organic coconuts, 1(2)

Nurwidayanti, D., & Mukminan, M. (2018). The influence of instructional media on economic learning outcomes in terms of the learning styles of State Senior High School students.Social Harmony: Social Science Education Journal, 5(2), 105-114

Ramli, A. (2017). The Effect of Applying the Jigsaw Cooperative Learning Model to Chemistry Subjects at Madrasah Aliyah.Lantanida Journal, 5(1), 34–38.

Riwayani, S., Harahap, RD. (2022). Does Blended Learning Improve Student's Learning dependence during the Covid-19 Pandemic? Evidence from a Labuhanbatu University, North Sumatera. : Jurnal Kependidikan. 8 (1), DOI: https://doi.org/10.33394/jk.v8i1.4509

Rosyidah, U. (2016). The Effect of the Jigsaw Cooperative Learning Model on the Mathematics Learning Outcomes of Class VIII Students of SMP Negeri 6 Metro.SAP (Organization of Educational Articles), 1(2), 115–124. https://doi.org/10.30998/sap.v1i2.1018

Setyosari, Purnaji. 2016. Research and Development Methods. Fourth edition. Jakarta. Prenadamedia Group.

Tyastirin, E., & Hidayanti, I. (2017).Parametric statistics for health research.Surabaya: Architecture study program at UIN Sunan Ampel.

Waci, D., & Nuraya, N. (2020). The Effect of the Jigsaw Cooperative Learning Model on Science Learning Outcomes Material of the Human Digestive Organs in Grade V Students at SDN 2 Suranenggala Lor Kec. Suranenggala Regency. Cirebon Academic Year 2017/2018.Journal of Physics and Science Education (JPFS), 3(1), 13-20.

Widoyoko, Eko Putro. (printed when, January 2018). Assessment of Learning Outcomes at School. Yogyakarta. Student Library.

Wondal, R., & Djamrud, S. (2014). Implementation Of The Jigsaw Type Cooperative Learning Model. 3(September), 293–298.

Yuristia, A. (2018). Education as Cultural Transfor mation.Journal of Social Sciences and Culture, 2(1), 1–13. http://jurnal.uinsu.ac.id/index.php/ijtimaiyah/article/view/5714