JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

Jurnal Eduscience (JES)
Volume 10, No. 2
Agustus, Tahun 2023
Submit : 10 Juni 2023
Accepted : 25 Juli 2023

IMPLEMENTATION OF MAKE A MATCH TYPE COOPERATIVE LEARNING MODEL ON THE LEARNING OUTCOMES OF BIOLOGY IN CLASS X-IPA ECOSYSTEMS IN SMA NEGERI 1 RINDI UMALULU

ANITA TEUL KAWUTAK[1]
[1]Biology Education, UniversitasKristen Wira Wacana Sumba, Indonesia
E-Mail: *anitateulkawutak@gmail.com*

Abstract
The research was conducted with the aim of knowing student learning outcomes using the Make A Match type cooperative learning model on ecosystem material at SMA Negeri 1 Rindi Umalulu. This research is a Classroom Action Research (PTK) consisting of pre-cycle activities, with a total of 30 students. Each cycle consists of four stages, namely planning, implementing, observing, and reflecting. In pre-cycle activities, it was found that overall student learning outcomes with an average of 53.2%, the number of students who completed 2 people with a percentage of 6.6% and who did not complete 28 people with a percentage of 93.3%. Furthermore, in cycle 1, student activities consisting of affective aspects included 9 students with good predicates and 21 students with sufficient predicates. Then the learning outcomes in cycle 1 mean the average value of all students is 65.4 students who complete consisting of 14 people with a percentage of 46.6% who do not complete consisting of 16 people with a percentage of 53.3%. In the second affective cycle there were 16 students with very good predicates and 14 students with good predicates. The results of learning in cycle 2, the average value of all students is 76.5 students who complete consist of 25 people with a percentage of 83.3% and students who do not complete consist of 5 people with a percentage of 16.6%.

Keywords: *Make A Match*, (Cooperative) Learning Model, Learning Outcomes.

Abstrak
Penelitian dilakukan dengan tujuan untuk mengetahui hasil belajar siswa menggunakan model pembelajaran kooperatif tipe Make A Match pada materi ekosistem di SMA Negeri 1 Rindi Umalulu. Penelitian ini merupakan Penelitian Tindakan Kelas (PTK) yang terdiri dari kegiatan prasiklus, siklus 1, dan siklus 2, dengan jumlah siswa sebanyak 30 orang. Tiap siklus terdiri dari empat tahapan yaitu perencanaan, pelaksanaan, observasi, dan refleksi. Pada kegiatan prasiklus didapati hasil belajar siswa secara keseluruhan dengan rata-rata 53,2% jumlah siswa yang tuntas 2 orang dengan presentase 6,6% dan yang tidak tuntas 28 orang dengan presentase 93,3%. Selanjutnya pada siklus 1, aktivitas siswa yang terdiri dari aspek afektif terdapat 9 siswa dengan predikat baik dan 21 siswa dengan predikat cukup. Kemudian hasil belajar pada siklus 1 nilai rata-rata seluruh siswa 65,4 siswa yang tuntas terdiri dari 14 orang dengan presentase 46,6% yang tidak tuntas terdiri dari 16 orang dengan presentase

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

53,3%. Pada siklus 2 afektif terdapat 16 siswa dengan predikat sangat baik dan 14 siswa dengan predikat baik. Hasil belajar pada siklus 2, nilai rata-rata seluruh siswa adalah 76,5 siswa yang tuntas terdiri dari 25 orang dengan presentase 83,3% dan siswa yang tidak tuntas terdiri dari 5 orang dengan presentase16,6%. Dengan demikian dapat di simpulkan bahwa penerapan model pembelajaran kooperatif tipe Make A Match terhadap hasil belajar Biologi kelas X pada materi ekosistem kelas X-IPA di SMA Negeri 1 Rindi Umalulu meningkat.

Kata kunci : Model Pembelajaran (Kooperatif), *Make A Match* , Hasil Belajar

INTRODUCTION

Education is the most basic thing that cannot be separated from everyone's life. Good education will produce good human resources because education is the key to all quality progress and development. Education takes place in all environments, both those specifically created for educational purposes and those that exist by themselves. Therefore, in creating a quality education, it is necessary to get better treatment, because education determines human civilization in the future (Triyanti, 2018:44). Education is basically a process to form humans in developing themselves, so that they are able to face all changes and problems with an open attitude and creative approaches without having to lose their identity (Azhari, 2015: 14). Science learning aims to help students master a number of facts and concepts of science as well as develop and instill scientific attitudes in their interactions with the social environment (Mardiana, 2014: 50).

According to Farida (2015: 25), the learning process is a series of communications between students and teachers, the learning process is effective if there is a transfer of material conveyed by the teacher can be absorbed into the cognitive structure of students. Effective learning can make it easier for students to learn or receive lessons (Makaborang Y, 2019: 135). Science learning aims to help students master a number of facts and concepts of science as well as develop and instill scientific attitudes in their interactions with the social environment (Mardiana, 2014: 50). Students are also guided to solve problems and relate them to everyday life, not just generate information (Weherma, 2019: 2). The science learning process should be able to develop student activity so as to foster student curiosity in order to achieve the above goals.

Based on the results of interviews with biology teachers at SMA Negeri 1 Rindi Umalulu on Monday, May 23 2022, many students were unable to work together in groups, did not dare to express opinions, students were less active in seeking information and sources of material being taught so they still received grades below the KKM. This is because the teacher plays the most role and the students

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

only listen or the students are less active and the teacher still uses the lecture method. During the learning process the teacher still uses a learning model that has not been innovative, namely still using the Discovery learning model where in class activities the teacher is dominant from students. In applying the model using the lecture method, so that only the teacher explains the material while the students are still passive and pay little attention to the teacher in delivering the material. In Biology, namely class X IPA, only 20% achieved the KKM and 80% were still below the KKM, seen from the results of the odd midterm test with the KKM score set in Biology subjects, namely 68, which resulted in low learning outcomes.

Learning outcomes using the Make A Match model students are instructed to find partners while learning about a concept or topic, in a pleasant atmosphere that can increase student learning motivation (Rusman, 2012: 123). This model is used by educators with the intention of inviting students to find answers that match the questions that have been prepared (Sutikno, 2014:45). The Make A Match learning model is based on training students to learn to be responsible for their respective tasks, build self-confidence, and train cohesiveness in group assignments. The Make A Match learning model is suitable for increasing student activity during the learning process.

Several previous studies have shown that the Make A Match type of cooperative learning model can improve student learning outcomes including research by Makmur Sirait and Putri Adilah Noer (2013) entitled The Effect of Make A Match Type Cooperative Learning Model on Student Learning Outcomes. The results showed that when using the make a match learning model, it increased from 72.84% (good enough) and increased again to 82.98%. Research conducted by Iwan and Ni Putu Puspa Lestari (2015) entitled Application of the Make A Match Type Cooperative Learning Model to Increase Motivation and Learning Outcomes of Biology in Ecosystem Materials. The results of the research showed that in the first cycle the students' mastery was 60% and increased after the second cycle to 80%. Meanwhile, research conducted by Khairiawati (2018) entitled Application of the Make A Match type Cooperative Learning Model to improve biology learning outcomes for class VII students of SMP Negeri 12 Pekanbaru in the 2017/2018 academic year. The results of his research on the cognitive value of students obtained absorption before doing PTK, namely 76.2% with 66% classical completeness, and after carrying out CAR in cycle 1, namely 82.3% and an increase of 6.1% with 80% classical completeness. And in cycle 11 it again increased by 3.2% to 85.5% with a classical mastery of 86.7%.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

RESEARCH METHODS

The type of research used in this research is Classroom Action Research (CAR) modeled by Kemmis and Mc Taggart (Dwitagama, 2012: 20) using a descriptive quantitative approach. This research was carried out using the PTK model which consisted of planning, implementing, observing, and reflecting. The population and sample in this study were 30 students of class X IPA -2 at SMA Negeri I Rindi Umalulu. While the data collection technique uses observation techniques (observations) and tests. This research was carried out in 2 cycles with ecosystem component material. Before the first and second cycles were carried out, pre-cyclical activities were carried out that used conventional learning models or had not yet implemented the Make A Match model. In the second meeting, cycle 1 was carried out with material on identifying ecosystems, and describing the relationships and interactions between ecosystems, and in cycle 2 with material on factors that can affect ecosystems and human efforts in maintaining ecosystems.

RESULTS AND DISCUSSION

Results

This research was conducted at SMA Negeri 1 Rindi Umalulu. Classroom action research was carried out in 3 meetings, consisting of pre-cycle, cycle I and cycle II. Following are the results of each cycle. The data collected in this study were the results of students' cognitive and affective tests from 30 students obtained through ongoing learning. Data analysis was carried out in a quantitative descriptive manner. This research was conducted 3 times, starting from the pre-cycle activities, cycle 1 and cycle 11. The pre-cycle activities started from the preparation, implementation and evaluation stages. Whereas in cycle 1 and cycle 11 starting from the stages of planning, implementation, observation (observation), and reflection. Each cycle is held once meeting. In pre-cycle activities explaining material about ecosystem components, cycle 1 with material identifying ecosystems and describing the relationships and interactions between ecosystems. Whereas in cycle 2 with material factors that can affect ecosystems and human efforts in maintaining ecosystems.

Before carrying out learning using the Make A Match cooperative learning model, pre-cycle activities are carried out. In this pre-cycle activity, researchers have not implemented a learning model that has been designed previously. The researcher only explained the existing material for students to

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

understand, then at the end of the lesson, the researcher gave a post-test to students to find out their learning outcomes. The purpose of this pre-cycle activity is to know clearly how student learning outcomes are without using the make a match type of cooperative learning model.

In implementing the learning, the researcher uses a cooperative learning model of the Make A Match type. Activities in the implementation of cycle 1 are divided into three parts, namely, initial, core, and closing activities. At the beginning of the activity begins with a prayer, then the researcher checks the presence of students. Next, the researcher provides a summary of the material and apperception to students to provoke students' memories regarding the previous material and the material to be studied. After carrying out the core activities, the researcher began to explain the material in a simple way so that students could understand it well. After that, the researcher began distributing students in groups consisting of 1-5 members. After the groups were formed, the researcher distributed question cards to each group. After the discussion was over, the researcher asked one of each group to collect the questions and answers at the front desk of the class. The researcher randomly shuffled each question and answer. Then the researcher divided again in each group to hold a question and answer discussion in each group in turn. After the discussion presentation process is complete, the researcher then invites students to jointly conclude or evaluate learning material, and the final activity is to provide motivation and appreciation to students.

Cycle 2 consists of one meeting, the time allocation is 2 x 45 minutes. This research was conducted in an even semester with material on factors that can affect the balance of ecosystems and human efforts in maintaining ecosystems. The aspects that are assessed from the cognitive domain are student learning outcomes in group discussion activities and posttest results. Meanwhile, the assessment on the affective aspect is courtesy, confidence, and cooperation.

1. Affective Aspect Learning Outcomes

Table 1. Recapitulation of Affective Assessment Aspects for each Cycle

Learning Activities	**Affective Aspect**			
	Predicate			
	Very good	Good	Enough	Not enough
Cycle 1	0	9	21	0

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

Cycle 2	16	14	0	0

The affective domain learning outcomes in cycle 1 were 66.7%, there were 9 students with good predicates and 21 students with sufficient predicates. This shows that in the affective aspect, some students have received a good predicate, but some students also have a large number of students who have received an adequate predicate. So it can be said that the achievement of the effective aspect has not been maximized. And in cycle 11 the affective domain learning outcomes increased to 76.1%, 16 people with very good predicates and 14 people with good predicates. In the implementation of cycle 1 activities the researcher monitored the student discussion process. In this presentation activity, many students were still shy and hesitant to speak in front of the class. This can be seen from several group friends who refused to read the questions and answers and speak to each other, and when they presented the results of their discussions, their pronunciation was still stuttering and their voices were so low. The researcher had to ask them several times to speak in a loud voice so that their voices could be heard properly. Furthermore, there were also several group friends who were busy with their friends so they didn't pay attention to the other groups who were discussing. When the students were working on the problem, it was seen that there were several students who were discussing with their classmates. The researcher reprimanded and gave a warning so that no students discussed when working on the problem. Furthermore, the researcher gave the opportunity for students to ask questions but it was seen that many students were hesitant and embarrassed to ask questions.

Therefore, it is necessary to improve affective assessment in cycle 11. The researcher controls all students and it can be seen that students are very active and really enjoy learning. In the next activity, the researcher asked each group to present the results of their discussion, while the researcher provided motivation and enthusiasm so that they had the courage to speak. On this occasion it was seen that the students were no longer shy and awkward in presenting the results of discussions with their group mates in front of the class. Students are also loud and firm when speaking and they can present correctly according to the questions that have been worked on in the right group. Researchers also saw that students paid close attention when other groups were presenting the results of their discussions.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

2. Student learning outcomes

Table 1. Recapitulation of Students' Cognitive Learning Outcomes for each Learning Activity

Learning Activities	Average	Number of students who completed	Percentage	Number of students who did not complete	Percentage
Pracyclus	53,2	2	6,6%	28	93,3%
Cycle 1	65,4	14	46,6%	16	53,3%
Cycle 2	76,5	25	83,3%	5	16,6%

The affective domain learning outcomes in cycle 1 were 66.7%, there were 9 students with good predicates and 21 students with sufficient predicates. The application of the cooperative learning model of the make a match type can be seen in the following table. The results of students' cognitive learning in pre-cycle activities were 53.2%, in cycle 1 it was 65.4% and in cycle 11 it increased to 76.5%. Based on the data above, it can be seen that there has been an increase in student development, both student activity in class and student learning outcomes. . With this increase, the researcher stopped in cycle 2 and did not continue in the next cycle.

Discussion

In accordance with the Cooperative Implementation Model of the Make A Match Type, Model according to Dewi (2019: 87), the teaching and learning process is an ongoing thing with the main objective being that students can understand the lessons conveyed by educators. This means that students need to get continuous learning in a variety of creative ways by educators so that students are able to understand that Make A Match learning is a type of cooperative learning model, namely a form of learning in which students learn and work in small groups collaboratively whose members consist of four to six people with heterogeneous group structures, Rusman (2018: 223).

Based on the implementation of class action for 3 meetings of pre-cycle activities, cycles 1 and 2 that student learning outcomes have increased. Increasing student learning outcomes is known by applying the make a match type of cooperative learning model. Observation results.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

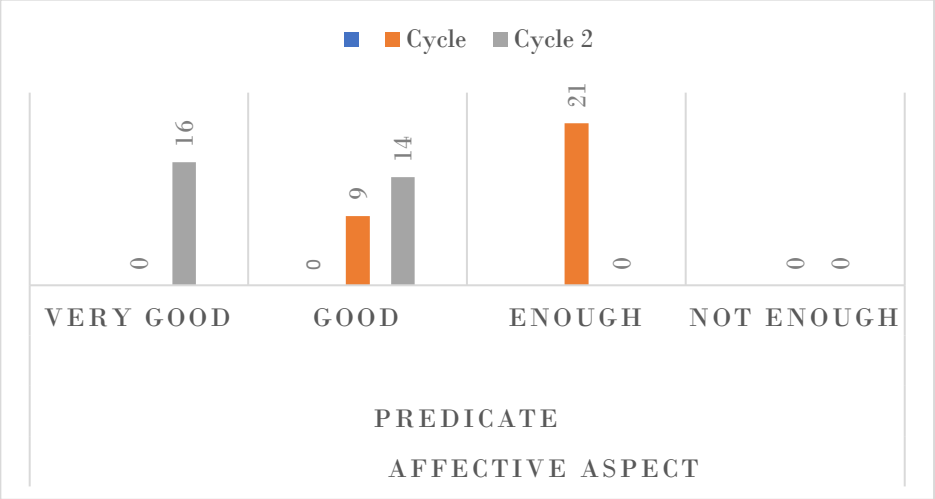

Figure 1. Diagram of Student Affective Learning Outcomes

The results of the researcher's identification related to the assessment of student activity in the class in cycle 1 were in the form of student affective aspects. This shows that in the affective aspect, some students have received a good predicate, but some students also have a large number of students who have received an adequate predicate. So it can be said that the achievement of the effective aspect has not been maximized. The results of observations of researchers and subject teachers related to aspects of affective assessment and it was found that in affective assessment, there were 16 students who got very good predicates and there were 14 students who got good predicates. The results of the affective assessment in cycle 2 are said to have a good development from the previous cycle.

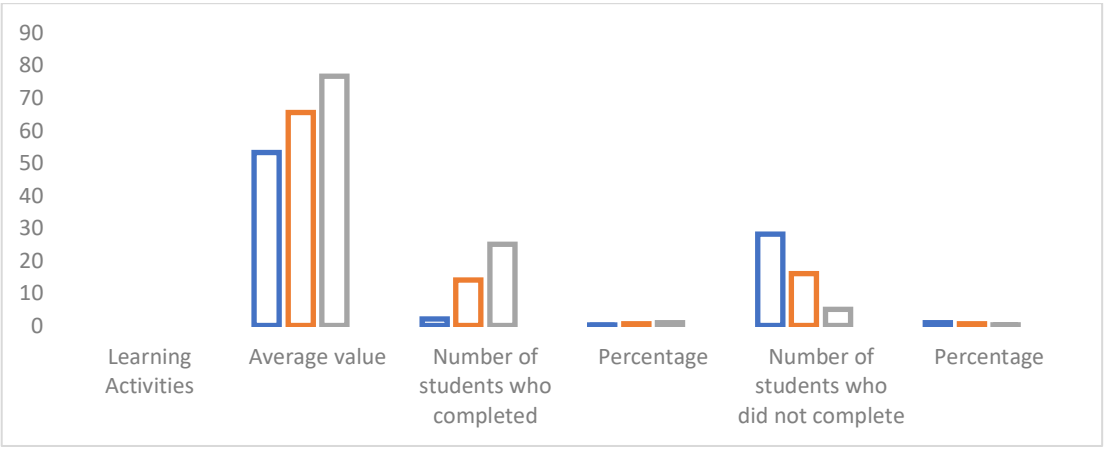

Figure 2. Diagram of Student Cognitive Learning Outcomes

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

Based on the results of data analysis on learning activities from pre-cycle, cycle 1, cycle 2 are as follows: The results of the researcher's identification regarding the assessment of student activity in the class in cycle 1 were in the form of student affective aspects, the researcher found that in the affective aspect, the data contained 9 students with good predicates and 21 people with enough predicates. This shows that in the affective aspect, some students have received a good predicate, but some students also have a large number of students who have received an adequate predicate. So it can be said that the achievement of the effective aspect has not been maximized.

Completeness of biology learning outcomes for ecosystem material in science class related to student learning outcomes in pre-cycle learning, namely that there were 2 students who completed with a percentage of 6.6%, while those who did not complete were 28 students with a percentage of 93%. Then the average value of students as a whole is 53.2. Looking at the existing achievements, know that the average student score is still very low, as well as the percentage of student learning completeness which is very low because many students get scores below the KKM, namely 68. Only what is there is the same as relevant research by (Mardiana, 2014: 5) that this pre-cycle activity answers that learning in the classroom requires a suitable and appropriate learning model to improve student learning outcomes. Thus, the researcher applied the Make A Match Type Cooperative learning model to students in class IPA 1 to improve learning outcomes.

Therefore, cycle 1 activities were carried out where student learning outcomes from post-test activities with existing data there were 14 students who completed with a percentage of 46.6% and 16 students who did not complete with a percentage of 53.3% then the overall average value was 65.4. For learning outcomes in cycle 1 it is said to be still low because it shows a higher percentage of incomplete. This happens because students do not understand well regarding the Make A Match Type Cooperative learning model. These results are the same as the relevant research by Makmur Sirait and Putri Adilah Noer (2013) that the effect of the make a match type of cooperative learning model on student learning outcomes.

To improve student learning outcomes, another cycle was carried out in cycle 2 where in cycle 2 cycle 2 was a continuation of cycle 1 with various improvements to the weaknesses in cycle 1. The observations of researchers and subject teachers related to aspects of affective assessment and it was found that in affective assessment, namely the existing data, there were 16 students who got very good predicates and there were 14 students who got good predicates. The results of the affective assessment in cycle 2 are said to have a good development from the previous cycle. This is because in cycle 1 activities

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

many students get enough predicates. But in cycle 2 there were no more students who got the sufficient category or predicate. Furthermore, for student learning outcomes from post-test activities, namely the data on there are 25 people who complete with a percentage of 83.3% and students there are 5 students who do not complete with a percentage of 16.6%, then the overall average score is 76.5. The achievement of student learning outcomes in cycle 2 was very satisfying and had maximum results because many students scored above the KKM, namely 68. The reflection stage carried out by the researchers found that there was increased development in students both in student activity in class and student learning outcomes. Students were able to understand well and were getting used to the Make A Match type cooperative learning model, and began to play an active role in discussions and were enthusiastic about finding their group mates. Students can use their time well so that when the time to look for groups is over, all students have found their friends. When making presentations in front of the class, students are no longer hesitant and are not ashamed to read the results of discussions with their friends. Students also enthusiastically listen when other groups make presentations (Anjani & Safitri, 2023; Raka Siwa et al., 2018; Safitri, 2017). Students can already understand the material so that when doing tests at the end of learning, students look calm in working on the questions. The development of student learning in cycle 2 had a very good increase from pre-cycle activities and cycle 1. With this increase, the researcher stopped in cycle 2 and did not continue in the next cycle. Similar to the relevant research conducted by Khairiawati, Khairiawati (2018) applied make a match cooperative learning to improve students' biology learning outcomes.

Based on the data obtained, the researcher found that there was a good increase in the percentage of student learning outcomes in each learning activity. In pre-cycle activities, the percentage of student learning outcomes was 6.6%, increasing in cycle 1, namely 46.6%, and increasing very maximally in cycle 2, namely 76.5%. Based on this, it is known that the cooperative learning model of the Make A Match type has succeeded in increasing student learning outcomes, especially in the ecosystem material carried out at SMA Negeri 1 Rindi Umalulu.

CONCLUSION

Student learning outcomes on ecosystem material before applying the Make A Match Type Cooperative learning model, namely pre-cycle activities, found that the average value of all students was 53.2, students who completed consisted of 2 students with a percentage of 6.6% and students who did not complete consisted of 28 students with a percentage of 93.3%. This shows that student learning outcomes before applying the learning model are still very low. The process of implementing the Make

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

A Match Type Cooperative learning model on ecosystem material for class X IPA at SMA Negeri 1 Rindi Umalulu has been carried out in accordance with the RPP that was compiled during the process of implementing the Make A Match type cooperative model several actions were carried out in each cycle, namely: planning, implementing actions, observing and reflecting. The application of the Make A Match type cooperative model shows an increase where in the implementation of learning using the Make A Match type cooperative model in cycle 1 the average score of all students is 65.4, students who complete consist of 14 students with a percentage of 46.6% and students who do not complete consist of 16 students with a percentage of 53.3%. Furthermore, in cycle 2 the average value of all students was 76.5 students who completed 25 people with a percentage of 83.3% and students who did not complete were 5 people with a percentage of 16.6%. With an increase in learning outcomes in accordance with the standard of completeness, the researcher stopped the research until cycle 2.

ACKNOWLEDGMEN

Praise and gratitude to the presence of God Almighty, because with His love and guidance, the writer can finish this journal. Writing this journal is to fulfill one of the requirements in completing the Undergraduate Program in the Biology Education Study Program, Faculty of Teaching and Education, Wira Wacana Christian University, Sumba. On this occasion, with humility the author realizes that in writing this journal, it is not easy so that the role and participation of various parties is very meaningful and helps the writer in completing this thesis. Therefore, the author expresses his gratitude to various parties who have supported and encouraged the author in completing this journal:

1. Mrs. Anita Tamu Ina, S.Si. M.Si as Chair of the Biology Education Study Program, Faculty of Teacher Training and Education, Wira Wacana Christian University, Sumba.
2. Mrs. Yohana Makaborang, S.Pd., Gr., M.Pd and Mrs. Yohana Ndjoeroemana, S. Pd., M.Pd as supervising lecturers. Thank you very much for all the direction and guidance during the preparation of this journal.
3. Mr/Mrs Lecturers and staff of the Biology Education Study Program who have guided and assisted the author while studying at the Biology Education Study Program, Faculty of Teacher Training and Education, Wira Wacana Christian University, Sumba.
4. Mr. Benyamin N. Jutalo, ST as the principal of the school and Mrs. Aprilia Hendrik S.Pd as subject teacher at SMA Negeri 1 Rindi Umalulu who have given research permits and assisted researchers when conducting research.

5. Beloved father and mother, and all the family who have supported and motivated me and prayed.
6. Class of 2018 friends and extended family of the Biology Education Study Program Student Association, Teaching and Education Faculty, Wira Wacana Christian University, Sumba, thank you for providing support, togetherness, motivation, memories, in the days spent while studying and being institutionalized.
7. My best friend Serli, who really helped me by lending me a laptop while working on my journal, and Rambu Yani, who has guided and motivated me.

REFERENCES

Arikunto, (2010). Research Procedures A Practice Approach. Jakarta: Rineka Cipta

Azhari, (2015:14). Application of the Discovery Learning Learning Model to Increasing Student Learning Outcomes in Class XI-IPA on Respiratory System Material at Unggul Sigli State High School. Journal of Educational Biology.

Badar, T I, (2014:95). Designing Innovative, Progressive and Contestural Learning Models. Journal of Biology Education and Learning. Jakarta. 2(2):95

Farida, (2015). The Effect of Vee's Heuristic Learning Strategy on Ability

Understanding of Students' Mathematical Concepts. Journal of Mathematics Education Algebra 6 (2) :113

Huda, Miftahul, (2014). Methodist and Paradigmatic Issues. Yogyakarta: Student Libraries.

Iwan, Ni Putu Puspa Lestari, (2015) "Implementation of the Make a Match Type Cooperative Learning Model to Increase Motivation and Learning Outcomes of Biology in Ecosystem Materials" in the journal of educational reasoning Vol 3, Number 2 (pages 78-83). Department of Biology, FMIPA University of Papua.

Kusnandar, (2012). Classroom action research. Jakarta: PT Raja Grafindo

Khairiawati, Khairiawati, (2018). Application of Cooperative Learning Type Make A Match Using Handouts to Improve Students' Biology Learning Outcomes

Class VII 1 SMP Negeri 12 Pekanbaru Academic Year 2017/2018. Islamic University

Triyanti, Merti, (2018:57). Efforts to Improve Biology Results of Class X Students Using the Student Acilitator and Explaining Learning Model. Journal of Biology and Science Education (BIOEDUSAINS). 1(1):144

Rusman, (2010). Learning Models Developing Teacher Professionalism. Jakarta: PT Raja Grafindo Persada

Anjani, D., & Safitri, I. (2023). Pembelajaran Kooperatif Tipe Tutor Sebaya dalam Meningkatkan Karakter Bersahabat/Komunikatif. *Jurnal Basicedu*, *7*(1), 1065–1074. https://doi.org/doi.org/10.31004/basicedu.v7i1.4833

Nuraisyah, S., Harahap, RD., Harahap, Darul (2021). Analysis of Internet Media use of Student Biology Learning Interest During Covid-19. Jurnal Penelitian Pendidikan IPA. DOI: 10.29303/jppipa.v7i2.624

Raka Siwa, L. A., Safitri, I., & Pasaribu, L. H. (2018). Perbandingan Model Pembelajaran Kooperatif Tipe Jigsaw dengan Stad (Student Team Achievement Division) terhadap Kemampuan Pemecahan Masalah Matematika Siswa Kelas XI SMA …. *Jurnal Pembelajaran Dan Matematika Sigma (JPMS)*, *4*(2), 17–26. https://doi.org/doi.org/10.36987/jpms.v4i2.1256

Safitri, I. (2017). Perbandingan Kemampuan Pemecahan Masalah Matematika Siswa yang Diajar dengan Model Pembelajaran Contextual Teaching And Learning dan Pembelajaran Konvensional. *Jurnal Pembelajaran Dan Matematika Sigma (JPMS)*, *3*(2), 10–14. https://doi.org/doi.org/10.36987/jpms.v3i2.1296

Sirait Makmur, Putri Adilah Noer, (2013:255). Journal of the Effect of Learning Models Cooperative Type Make A Match Against Student Learning Outcomes, Unime FMIPA Physics Education Study Program

Rusman, (2018). Learning Models. Depok: King of Grafindo Persada

Weherma, D.V. (2019). The Effect of the Jigsaw Type Learning Model Accompanied by Mind Mapping on Science Learning Outcomes in Class VII Students of Mts Miftahul Huda Central Lampung