Journal of Biological Science and Education
~JBSE~
Website: https://usnsj.id/index.php/biology
Email: biologi_jbse@usn.ac.id

The Implementation of Cooperative Learning Model Type Jigsaw to Improve Student Learning Activities in Class XI IPA 3 SMA Negeri 5 Kendari

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ARTICLE INFO

E-ISSN: 2721-0804
P-ISSN: 2723-6838
Vol. 5, No. 1, June 2023
URL: https://usnsj.id/index.php/biology/index

Suggestion for the Citation and Bibliography
Citation in Text:
Haya, L. (2023)
Bibliography:
Haya, L. (2023). The Implementation of Cooperative Learning Model Type Jigsaw to Improve Student Learning Activities in Class XI IPA 3 SMA Negeri 5 Kendari. *Journal of Biological Science and Education, 5*(1), 1-9.

Abstract

Education is not only measured by theoretical knowledge, but also by practical abilities and interpersonal skills. The low level of student learning activity reflects a mismatch between conventional teaching methods and students' actual needs in developing competencies. This study aims to increase student learning activities in biology class XI IPA 3 SMA Negeri 5 Kendari by applying the Jigsaw cooperative learning model. This research was conducted in the second semester of the 2013/2014 academic year. The type of research used is classroom action research (PTK) Kemmis and Taggart with three learning cycles. Each cycle goes through four stages: (1) planning; (2) carrying out actions; (3) observation and (4) reflection. The source of this research data is the measurement of observation sheets in Cycle I, Cycle II, and Cycle III. The data obtained were analyzed using descriptive analysis. From the observations, it was obtained that student learning activities in cycle I with an average student learning activity in cycle I was 3.31 with a percentage of 82.74%, in cycle II it was 3.48 with a percentage of 86.90%, in cycle III with 3.68 with a percentage of 91.96%. It can be concluded that the application of the Jigsaw cooperative learning model can increase student learning activities in biology class XI IPA 3 SMA Negeri 5 Kendari

Keywords: *Learning Activities, Jigsaw*

A. Introduction

The learning process is a series of interactions and activities that occur between individuals (such as students or learners) and the learning environment (such as teachers, subject matter, teaching materials, technology, and peers) that aim to acquire new knowledge, skills, understanding, and experiences. This process involves information processing, social interaction, and changes in behaviour or improvements in understanding and skills.

The teacher's role in the learning process is very important and has a major impact on student development. some of the key roles played by the teacher in the learning process are as Learning Facilitators, Learning Planners, Motivators, Information Conveyors, Individual Supporters, Behavioral Models, Evaluators, Learning Environment Creators, Academic Counselors, and Innovators. By carrying out these roles well, teachers can create positive

learning experiences, build students' intrinsic motivation, and help them develop the knowledge, skills, and character needed to succeed in life.

The role of the teacher as a lesson planner is very important in creating an effective and meaningful learning experience for students. As a lesson planner, the teacher has the responsibility to design lesson plans that cover various aspects, such as learning objectives, material content, teaching methods, evaluation, and approaches that suit students' needs.

Based on initial observations at SMA Negeri 5 Kendari on January 23 and 24 2014 by interviewing XI IPA 3 teachers, information was obtained that most students were still noisy, difficult to direct in discussions, and students did not share knowledge with classmates. In addition, it was found that the application of learning models was not by the characteristics of the material and the management of study groups had not been carried out properly. This resulted in a low student learning activity

One of the learning strategies that can increase student activity in learning biology is the Jigsaw cooperative learning model. According to Kahar et al (2020), the Jigsaw type cooperative learning model emphasizes students' individual responsibility for the tasks given and encourages them to share their understanding with other group members. In this context, learning with this model emphasizes theoretical aspects rather than focusing on formulas or equations in the material being taught. Therefore, students are expected to understand the material in depth as a basis for knowledge before being able to apply it.

Research conducted by Hia (2013) states that applying the *Jigsaw cooperative learning type* in the learning process can increase student learning activities. Therefore, the Jigsaw-type cooperative learning model is very important to be applied in science biology learning so that the learning activities of Class XI IPA 3 students at SMA Negeri 5 Kendari can be improved.

B. Literature Review

1. *Learning Activity*

Students' involvement in the learning process is not limited to their personal knowledge construction. They proactively develop an understanding of the problems or situations they face during learning activities (Raditya & Sujadi, 2014).

The types of learning activities are classified by Diedric *in* Sardiman (2007) as follows:

a. *Visual activities,* which include for example reading, paying attention to demonstration pictures, experiments and other people's work.
b. *Oral activities,* such as stating, formulating, asking questions, giving suggestions, issuing opinions, conducting interviews, discussions and interruptions.
c. *Listening activities* such as listening to conversations, discussions, music and speeches.
d. *Writing activities,* for example writing stories, essays, reports, questionnaires and copying.
e. *Drawing activities,* for example, drawing, making graphs, maps and diagrams.
f. *Motor activities,* which include conducting experiments, making construction, repairing models, playing and gardening.
g. *Mental activities,* for example, responding, remembering, solving problems, analyzing, seeing relationships and making decisions.
h. *Emotional activities,* for example, taking interest, feeling bored, happy, excited, passionate, brave, calm and nervous.

2. *Jigsaw Type Cooperative Learning Model*

The Jigsaw cooperative learning model is a learning model designed to increase students' sense of responsibility for the material being studied. Students not only learn the material provided but are also ready to provide and teach the material to their group members. Thus, students are interdependent on one another and must work cooperatively to learn the assigned material. In the Jigsaw learning model, students are divided into small groups consisting of 3-5 people consisting of the original group and the expert group (Hamdani, 2017).

The jigsaw learning model can also be interpreted as a structured group method that relies on cooperation and shared responsibility. This approach ensures that each student has important responsibilities within the group. In addition to collaborating in the learning process to gain knowledge about something, students also receive respect and trust from teachers and colleagues in their groups to master a particular topic and issue. After that, they will share explanations with friends in the group.

The teaching and learning process uses a jigsaw type cooperative learning model requires a longer time, especially if the spatial arrangement is not well conditioned, so it takes time to

change positions which can also cause noise and takes time thorough preparation before this learning model can run well. The theory that Underlying the jigsaw type cooperative learning model is Vygotsky's social learning theory. Vygotsky's theory places more emphasis on the social aspects of learning. According to Vygotsky that the learning process will occur if students work or handle tasks things they haven't learned yet, but these tasks are still within their reach. Vygotsky believed that higher mental functions generally arise in conversation and cooperation between individuals before those higher mental functions are absorbed in that individual (Lubis, 2020).

Jigsaw cooperative learning model, there are two groups, namely the original group and the expert group. namely :

1. Cooperative Groups: Students are grouped in small groups of 3 to 5 members. Each group gets a discourse or assignment that is relevant to the material being studied. Each group member receives a different task to understand various information.
2. Expertise Group: Students who have the same task or discourse are combined in expert groups. The number of expert groups is adjusted to the number of tasks or discourses that have been prepared by the research team. In expert groups, students work together to achieve an in-depth understanding of the task or discourse they are dealing with. Each member of the expert group is responsible for understanding and conveying information about the work and discourse they have understood to the cooperative group.
3. Back Integration into the Cooperative Group: After the task in the expert group is completed, students rejoin the cooperative group. Each student has the opportunity to take turns sharing the work of their group of experts. After all the assignments were completed, each group reported the results as a whole to the teacher. The teacher provides additional clarification or explanation if needed.

C. Methodology

1. Research design

This research was conducted in the even semester of the 2013/2014 academic year on the subject of human and animal excretory systems at SMA Negeri 5 Kendari. The subjects of this research were all students of class XI IPA 3 at SMA Negeri 5 Kendari with a total of 42 students, consisting of 11 male students and 31 female students.

This type of research is classroom action research (CAR). The characteristics of PTK are cyclical actions to improve the learning process in the classroom. This research was carried out in three cycles, each cycle consisting of two meetings with the subject of the excretory system of humans and animals.

2. Instrument

The instrument used in this study was the observation sheet instrument of student learning activities in cycles I, II and III. Observation sheets were prepared based on indicators of student learning activities, namely collaborating, taking tests, formulating answers, interrupting, group discussions, solving problems and making decisions among fellow members of the expert and original groups in class discussions. Observations were made during the learning process to measure the learning activities of class XI IPA3 students at SMA Negeri 5 Kendari.

3. Data analysis technique

The data in this study were analyzed using descriptive statistical analysis to provide an overview of increasing student learning activity in biology subjects of human and animal excretory systems by applying the Jigsaw cooperative learning model. The steps in analyzing student learning activity data are as follows:

a. Data tabulation is made in the form of student acquisition scores on the observation sheets of student learning activities cycles I, II and III.
b. The data that has been tabulated is analyzed and then graphs are made to measure the level of success of student learning activities.
c. The success of student learning activities is measured using the following formula:

$\%KABS = \frac{total\ score\ obtained}{maximum\ score} x\ 100\%$ (Usman and Setiawati, 2001).

d. The average student learning activity is measured by the following formula:

$\bar{x}=\frac{\sum x}{n}$

Information:

$\overline{X}$ = The average value obtained by students

n = Number of students

x = Value obtained by each student (Sudjana, 2008).

e. The distribution of student learning activity values is adjusted based on the range of values in Table 1.

Table 1. Range and Criteria of Student Scores

Reach	Criteria
85-100	Very good
75-84	Good
60-74	Currently
45-59	Less
<45	Very less

Source: Hunaningsih, et al (2017)

D. Findings and Discussion

1. *Findings*

Observation of student learning activities is carried out during the learning process by using observation sheets. The results of the analysis of the observation sheet of student learning activities in cycle I can be seen in Table 2.

Table 2. Results of the assessment of student learning activity observation sheets in cycle I

No.	Student Learning Activities	Origin Group						Average (%)
		1	2	3	4	5	6	
1.	cooperate	2.5	3	3	3	3	3	2.92 (72.92)
2.	Doing tests	3	3.5	3.5	2.5	3.5	3	3.17 (79.17)
3.	Formulate answers	3.5	3	3.5	3	4	3.5	3.42 (85.42)
4.	interrupt	3	2	2.5	3	3	3	2.75 (68.75)
5.	Listening to group conversations/discussions	4	3.5	3.5	3.5	3.5	3	3.50 (87.50)
6.	Solve the problem	4	4	3.5	4	4	3.5	3.83 (95.83)
7.	Make decision	3.5	3.5	3.5	4	3.5	3.5	3.58 (89.58)
Average		3.4	3.2	3.3	3.3	3.5	3.2	3.31
Percentage (%)		89.93	80.36	82.14	82.14	87.50	80.36	82.74

Based on the analysis, the average student learning activity during the learning process in cycle I was 3.31 with a percentage of 82.74%.

In this section, there are discussions with observers I, II, and III to identify and evaluate student weaknesses and achievements. This aims to prepare improvements in the next cycle. The learning process in the previous cycle experienced deficiencies that required improvement, such as (1) the use of time that was not by the indicators and learning objectives to be achieved, (2) students were not used to discussing in groups that had diverse members, (3) students still faced obstacles in adapting when moving from the home group to a group that has more skilled members, (4) student learning participation is limited because some students are too focused on their activities, disturbing other group members.

Cycle II learning is carried out by taking into account the reflections of cycle I, namely (1) Teachers should design and carry out learning activities in class between time allocation and

indicators and learning objectives so that they are more perfect and proportional, (2) Teachers should be better at organizing and coordinating students and providing understanding to students that the importance of cooperation to complete group assignments, (3) Teachers should be more skilled in guiding students in group work so that they can complete group assignments in an orderly manner, (4) Teachers should further enhance student learning activities so they can understand the learning material conveyed by the teacher to improve students' understanding of biology concepts.

Observation of student learning activities is carried out during the learning process by using observation sheets. The results of the analysis of the observation sheet of student learning activities in cycle II can be seen in Table 3

Table 3. Results of the assessment of student learning activity in cycle II

No.	Student Learning Activities	Origin Group						Average (%)
		1	2	3	4	5	6	
1.	cooperate	3.5	3	3.5	3	3	3.5	3.25 (81.25)
2.	Doing tests	2.5	4	3.5	3	3	3.5	3.25 (81.25)
3.	Formulate answers	3.5	4	3.5	4	3.5	3.5	3.67 (91.67)
4.	interrupt	4	3	3	3	3	4	3.33 (83.33)
5.	Listening to group conversations/discussions	3.5	3.5	3.5	3.5	3	4	3.50 (87.50)
6.	Solve the problem	4	3.5	3	3.5	4	4	3.67 (91.67)
7.	Make decision	4	3.5	3.5	3	4	4	3.67 (91.67)
Average		3.6	3.5	3.4	3.3	3.4	3.8	3.48
Percentage (%)		89.29	87.50	83.93	82.14	83.93	94.64	86.90

Based on the analysis of the average student learning activity during the learning process activities in cycle II of 3.48 with a percentage of 86.90%.

In this section, there are discussions with observers I, II, and III to analyze and evaluate student weaknesses and achievements. The aim is to make improvements at the stage of cycle III. Although there are some deficiencies in the learning process in cycle II, some of them include: (1) students are still more interested in irrelevant conversations in expert groups than answering questions that are already in the Student Worksheet (LKS), (2) some Most students only record answers without understanding the source and accuracy of answers from members of the expert group, which causes the answers expressed in class discussions after returning to the home group to tend to be similar, (3) the active participation of students in the expert group and home group is still dominated by only a few students.

In cycle III, teaching will be carried out by considering the reflection results of the actions taken in cycle II, namely: (1) The teacher should give a firm warning to students and remind them to focus on the learning process, so they can understand the material discussed in the group experts, (2) Teachers should direct students to work together in completing assignments and formulating answers in LKS in their respective home groups. (3) The teacher should guide students to actively listen to group discussions/discussions, intervene if there are answers proposed in the original group, solve problems, and make decisions in both the expert group and the home group.

Observation of student learning activities is carried out during the learning process by using observation sheets. The results of the analysis of the observation sheet of student learning activities in cycle II I can be seen in Table 4

Table 4. The results of the assessment of student learning activity observation sheets in cycle III

No.	Student Learning Activities	Origin Group						Average (%)
		1	2	3	4	5	6	
1.	cooperate	3	3.5	4	3	3	3.5	3.33 (83.33)
2.	Doing tests	3.5	3.5	4	3.5	3.5	4	3.67 (91.67)
3.	Formulate answers	4	4	4	4	4	4	4.00 (100)
4.	interrupt	3	3	3.5	3.5	3	4	3.33 (83.33)
5.	Listening to group conversations/discussions	3.5	3.5	4	4	4	4	3.83 (95.83)
6.	Solve the problem	4	3.5	3.5	4	4	3.5	3.75 (93.75)
7.	Make decision	4	3.5	3.5	4	4	4	3.83 (95.83)
Average		3.6	3.5	3.8	3.7	3.6	3.9	3.68
Percentage (%)		89.29	87.50	94.64	92.86	91.07	96.43	91.96

Based on the analysis of the average student learning activity during the learning process activities in cycle III of 3.68 with a total percentage of 91.96%.

Student learning activities in cycle III were satisfactory because they increased according to achievement indicators. In the biology learning activities, students are seen collaborating, taking tests and formulating LKS answers in expert groups. In addition, students are also able to interrupt, listen to group conversations/discussions, solve problems and make decisions in the home group.

The graph of the percentage of the average score obtained by the indicators observed in student learning activities by applying the *Jigsaw-type cooperative learning model* in cycles I, II and III can be seen in Figure 1.

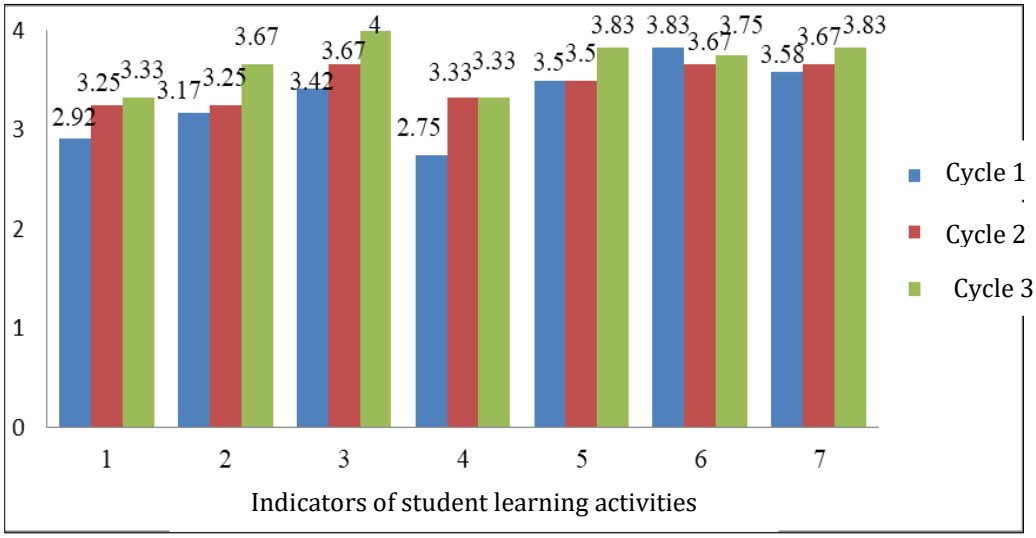

Figure 1. The average score of student learning activity indicators in cycles I, II, III

Based on Table 2, it can be seen that the average student learning activity in cycle I was 82.74 % in the good category, where the lowest student learning activity was the ability to interrupt with a value of 2.75 and the highest student learning activity was in the problem-solving indicator with a value of 3, 83. In cycle II, several indicators experienced an increase, including the lowest student learning activity in cycle I, which increased to 3.33. However, the indicator for listening to group conversations/discussions from cycle I to cycle II remained with a value of 3.5. This can be seen in Figure 1 which shows an increase from cycle I to cycle II. In cycle III every aspect experienced an increase but the interrupt aspect remained the same as in cycle II and did not experience an increase with a value of 3.33.

The average increase in student learning activity in cycle I, Cycle II and Cycle III can be seen in Figure 2.

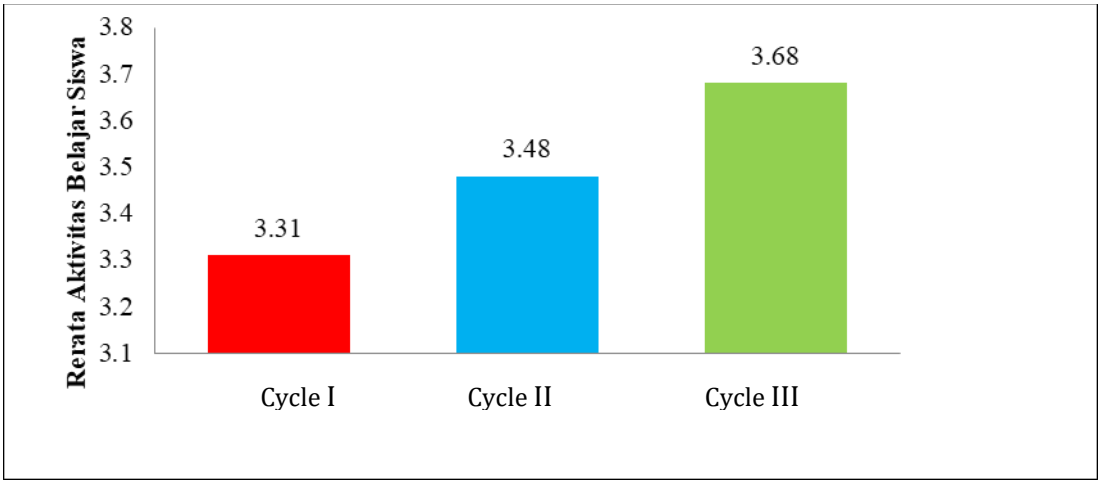

Figure 2. Graph of Average Student Learning Activity Cycles I, II and III

Based on Figure 2, it can be seen that there was an increase in the average score of student learning activities from cycle I to cycle II of 0.17 with a percentage of 4.16% and cycle II to cycle III increased by 0.20 with a percentage of 5.06%.

2. Discussion

Based on the results of data analysis of student learning activities in the learning process in cycle I, the average score of student learning activities was 3.31 with a percentage of 82.74%. This shows that the application of the Jigsaw cooperative learning model has been carried out well, but there are still deficiencies that must be corrected and improved, including the time allocation used not by the indicators and learning objectives to be achieved in the learning process. Students are not familiar with group discussions with heterogeneous members. Students are still noisy and difficult to direct when moving from the original group to the expert group and vice versa. This is in line with Laoli et al statement (2020) that The application of the jigsaw cooperative learning model can significantly improve student learning outcomes and increase the significance of collaboration, as well as social and personal skills.

Another drawback is that some students are busy themselves and seem to disturb other group members without being directly involved in formulating answers in the expert group. So some members of the other expert groups are disturbed in working together to work on and formulate answers. This can be seen in the average interruption indicator which only achieved a score of 2.75 with a percentage of 68.75%. Followed by the indicator of cooperation reaching an average of 2.92 with a percentage of 72.92%. The indicator of taking the test reached an average of 3.17 with a percentage of 79.17%. Furthermore, there is an indicator formulating answers in the fourth position from the bottom reaching an average of 3.42 with a percentage of 85.42%. The indicator for listening to group conversations/discussions reached an average of 3.5 with a percentage of 85.70%. In the sixth position is the indicator for making decisions which reaches an average of 3.58 with a percentage of 89.58%. While at the peak position, the indicator solves the problem almost perfectly which reaches an average of 3.83 with a percentage of 95.83%.

Examining these achievements, the teacher must spur student learning activities to respond to answers from other home groups, it is not easy to accept answers from other home groups but must be critical so that the answers agreed with the teacher become accurate. Some of the deficiencies were then reflected and made improvements for the implementation of the actions in cycle II. This is supported by the statement of Hanafiah and Suhana (2010) that student learning activities must involve all psychophysical aspects, both physical and spiritual. So that there is a behaviour change appropriately, quickly, easily, and correctly. Seeing this, a change is needed to understand the different student learning styles in the learning process so that students become active and motivated in learning activities by presenting communicative and interesting learning for students.

The results of observing the actions of the second cycle, the average student learning activity was 3.48 with a percentage of 86.90%. This shows that the application of the Jigsaw cooperative learning model is better and gets an interesting response from the original group which consists of expert groups. This fact can be seen in the increase in the average interruption indicator score from 2.75 with a percentage of 68.75% in cycle I to 3.33 with a percentage of 83.33%.

However, in cycle II there is also a decrease, namely indicators of solving problems. In cycle I was the highest indicator but in cycle II it decreased successively from 3 .83 to 3.67.

Step ledge method Jigsaw is divided into stages." First do reading activities to identify information. Student obtain topics problem For be read, so get information about the problem The two expert group discussions. Students who have got the perma topic same error meet in a group or what we call with a group of experts to discuss the topic the third problem is the group report. Expert group return to the original group and explain the results obtained from the expert team. Fourth Quiz conducted covers all topics the problems discussed earlier and fifth Group score setting and determining group awards. These steps are very important in the ongoing learning process, because the success of students depends on the teacher's methods or methods in teaching, with interesting methods, can create student interest and a sense of enjoyment in participating in learning, and learning can continue smoothly (Supriyadi & Anam, 2022).

This indicates that students experience obstacles in solving problems so they need to be guided and directed so they can answer LKS questions. Thus the teacher as class manager must guide and direct students in solving LKS problems. This is by the teacher's task stated by Usman (2003) that students continue to be guided and directed by the teacher in learning activities but still provide opportunities for students to gradually reduce their dependence on the teacher so that they can guide their activities so that they are accustomed to being independent.

The results of the analysis of action observation cycle III have an average student learning activity of 3.68 with a percentage of 91.96%. This shows that the Jigsaw-type cooperative learning model by the teacher is proven to be able to increase student learning activities starting from indicators of working together, taking tests, formulating answers, interrupting, listening to group conversations/discussions, solving problems and making decisions.

The application of learning by applying the Jigsaw cooperative learning model can improve and cover deficiencies in the learning process in the classroom. This has been tested empirically by research conducted by Indriwati (2010) where Jigsaw cooperative learning can increase student learning activity

E. Conclusion

The application of the Jigsaw cooperative learning model can increase student learning activities on the subject of human and animal excretory systems for class XI IPA3 students at SMA Negeri 5 Kendari. This can be seen from the average score of student learning activities from cycle I of 3.31 with a percentage of 82.74% which increased in cycle II of 3.48 with a percentage of 86.90% which continued to increase in cycle III with 3.68 with a percentage of 91.96%.

F. Reference

Hanafiah dan Suhana. 2010. *Konsep Strategi Pembelajaran.* Rafika Aditama. Bandung.

Hamalik, O., 2003. *Model Pendidikan dan Kesulitan-kesulitan Belajar.* Tarsito. Bandung.

Hamdani . (2017). Strategi Belajar Mengajar , Bandung: Pustaka Setia

Hia, Y. (2013). Penerapan model pembelajaran kooperatif tipe jigsaw untuk meningkatkan aktivitas dan hasil belajar matematika siswa kelas VIII. *Generasi Kampus*, *6*(2)

Ibrahim, M., 2000. *Pembelajaran Kooperatif.* Universitas Negeri Surabaya. Surabaya.

Kahar, M. S., Anwar, Z., & Murpri, D. K. (2020). Pengaruh model pembelajaran kooperatif tipe jigsaw terhadap peningkatan hasil belajar. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *9*(2), 279-295.

Laoli, J. K., Dakhi, O., & Zagoto, M. M. (2022). Implementasi model pembelajaran jigsaw untuk meningkatkan motivasi dan hasil belajar mahasiswa pendidikan bk pada perkuliahan filsafat pendidikan. *Edukatif: jurnal ilmu pendidikan*, *4*(3), 4408-4414.

Lie, A., 2002. *Cooperative Learning (Mempraktikkan Cooperative Learning di Ruang-ruang Kelas*. Grasindo. Jakarta.

Lubis, R. S. (2021). Pengaruh Penggunaan Model Pembelajaran Kooperatif Tipe Jigsaw terhadap Hasil Belajar Mahasiswa. *AXIOM: Jurnal Pendidikan Dan Matematika*, *9*(2), 199-209.

Purwanti, H. Y., 2007. *Efektifitas Penerapan Pembelajaran Kooperatif Tipe STAD dan Jigsaw dalam Materi Pokok Klasifikasi Makhluk Hidup di MTs NU Ungaran*. Skripsi. Program Pendidikan Biologi Fakultas MIPA Universitas Negeri Semarang. Semarang.

Safilu, 2010. *Hakekat dan Strategi Pembelajaran Biologi untuk Memberdayakan Keterampilan Berpikir Siswa*. Abstr. Universitas Negeri Malang. Malang.

Sardiman, A.M., 2007. *Interaksi dan Motivasi Belajar Mengajar*. Raja Grasindo. Jakarta.

Supriyadi, A., & Anam, K. (2022). Penerapan Model Pembelajaran Kooperatif Tipe Jigsaw Terhadap Aktivitas belajar Santri. *Edupedia: Jurnal Studi Pendidikan dan Pedagogi Islam*, *7*(1), 83-91.

Usman, U.M., 2003. *Menjadi Guru Profesional.* Remaja Rosdakarya. Bandung.