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The Effect of Jigsaw Learning Strategies on the Metacognition of Tenth Grade Students on Fungi Material: A Case of MA Baitussalam

Sulis Tia Ningsih* & Syarifah Widya Ulfa

Department of Biology Education, Universitas Islam Negeri Sumatera Utara, Indonesia

Abstract: This study aims to find out how the influence of Jigsaw learning strategies on students' metacognition development. This study uses a quantitative method by distributing questionnaires to students in both classes, namely control and experiment. The population in this study was 56 students. From this study, it was found that the use of the Jigsaw type learning model in MA could provide an increase in students' metacognition. This is indicated by the average number of students' metacognition in the treatment class is higher than in the control class, namely 7,643 for the treatment group and 6,286 for the control group. The treatment class is smaller than the control class if the standard deviation is the benchmark, with 0.1174 for the treatment class and 0.1442 for the control class, which means that the jigsaw type cooperative learning model has an effect on improving students' metacognition. .

Keywords: cooperative learning, jigsaw, metacognition.

Abstrak: *Penelitian ini bertujuan untuk mencari tahu bagaimana pengaruh strategi belajar Jigsaw pada perkembangan metakogni Murid. Penelitian ini menggunakan metode kuantitatif dengan menyebarkan kuesioner pada murid terhadap kedua kelas yaitu kontrol dan ekperimen. Jumlah populasi dalam penelitian ini sebanyak 56 Murid. Dari penelitian ini menemukan hasil jika penggunaan model pembelajaran tipe Jigsaw di MA bisa memberikan peningkatan pada metakognisi murid. Hal ini ditandai dengan jumlah rata-rata metakogni Murid pada kelas perlakukan lebih tinggi dari pada kelas kontrol, yaitu 7,643 untuk kelompok perlakukan dan 6,286 untuk kelompok kontrol. Kelas perlakuan lebih kecil dari kelas kontrol apabila standar deviasinya menjadi tolak ukur, yaitu dengan 0,1174 untuk kelas perlakukan dan 0,1442 untuk kelas kontrol yang artinya, model pembelajaran kooperatif tipe jigsaw memiliki pengaruh dalam meningkatkan metakognisi siswa.*

Kata kunci: *Pembelajaran kooperatif, Jigsaw, metakognisi.*

▪ INTRODUCTION

Education is a major thing in developing quality in a person or country. this is because, with education, you can obtain or form better human resources and have strong competitiveness. What is meant by education from KBBI is that it comes from the word "education" which is the root of the term "education" (educate). In Suwarno's book, Prof. Brodjonegoro uses several terms related to education, including educare (training or teaching), erzhicung, pelvicawentah (changing), and opvoeding (awakening) (awakening or activating). Prof. Brodjonegoro interprets education in this sense as a means to assist human development from infancy to physical and spiritual maturity in order to carry out his personal life tasks (Purwanto, 2014). Education aims to develop students' abilities both in the field of faith in God, having good morals, having a good personality, being independent, intelligent, disciplined, and tough. However, sometimes there are obstacles faced by teachers when delivering learning materials.

Sulis Tia Ningsih
*Email: sulistia.ningsih@uinsu.ac.id

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Based on the results of observations and interviews that were conducted with a biology teacher at Baitussalam MA on January 27 2022, the constraints that teachers often face in the classroom during the process of teaching and learning activities are learning motivation and low awareness and student skills. In addition, the learning process applied has not been able to achieve the learning objectives optimally. Lack of awareness and student skills are also accompanied by student learning outcomes. This results in student learning outcomes of approximately 55% of the entire population getting grades.

Most learning activities place a heavy emphasis on memorization, and often the teacher controls this activity. As a result, students become less engaged and more easily bored while studying. This is in accordance with what was stated by Jayapraba (2019) which states that the low learning media used by teachers in teaching the material will make students increasingly bored with the material being taught. Therefore, in addition to helping conceptual understanding, methods and types of learning are needed that require students to actively participate. The cooperative learning model called Jigsaw is a learning method or model that is suitable to be applied. One of the many student-focused learning strategies is cooperative learning with a jigsaw.

The Jigsaw cooperative model is one of the best cooperative learning models to use. Jigsaw is a learning model structured cooperative learning, which has been used successfully by many education system to improve academic achievement among students (Atallah, 2021). Meanwhile, according to Begum (2019) the Jigsaw learning model is one of the learning strategies under cooperative learning where, as in a jigsaw puzzle, the lesson content is divided into several different pieces of information and then given to groups of students who will later explain each other's parts. parts and generate a whole jigsaw puzzle to solve. In this model, students study in small groups of four to five people by paying attention to heterogeneity, encouraging collaboration, and each team is responsible for studying questions related to the lesson presented by the teacher and also has the responsibility to present it in front of the class. (Slavin, 2009) states that the Jigsaw cooperative learning type is very suitable when the lesson given is in the form of writing or stories. Based on research conducted by Nduji (2020) found that the use of jigsaw-based cooperatives learning strategies are superior in increasing interest and achievement in learning physics students than the lecture method. Kumar (2017) also stated the same thing, if students were more active in learning after applying the jigsaw type cooperative learning method. Likewise with research conducted by (Isjoni, 2010) states that if cooperative learning is very appropriate compared to other learning models.

Students receive and learn from what is explained by educators using Jigsaw cooperative learning, however, these students can also learn from other students and work together with others while doing so. According to (Haji et al., 2011), interpreting cooperative learning is a form of learning in which the method of learning is carried out in groups of 4-6 students to inspire students to be more enthusiastic about learning. One of the goals of applying jigsaw type learning media is to improve students' metacognition. Create groups members sharing material is a way of structuring interdependence tasks. This model also enhances higher-order thinking skills, including creative thinking and students' metacognition (Inayah, 2021). Veenman, Wilhelm, & Beishuizen in Jbeili (2012) suggest metacognitive strategies that will be taught to enable

students to learn by understanding. Metacognition is thinking about thinking or cognition about one's consciousness that it aims to improve learning and solve problems (Bustami, 2017). Meanwhile, according to Bahri (2016) Metacognition is awareness of one's thinking about thinking processes. Metacognition usually addresses two aspects of thinking. The first is one's awareness of one's own thought processes. The second trait is the capacity to control their own cognition through conscious awareness (Azmin, 2016). According to Dunlosky & Metcalfe in Shahbari, cognitive processes such as problem solving, memory, knowledge, and reasoning are manifestations of cognition. A student's ability to be aware of his knowledge and how he applies it, or metacognition, can determine how successfully he completes a math task. In addition, the term "metacognition" can be used to describe what he perceives as a learner and how he manages and modifies his behavior (Shahbari, 2015). Metacognition skills are skills that process one's thoughts properly in order to use the knowledge they already have, reflect and control the processes and results of the thinking itself (Azizah, 2022). Based on this information, it can be concluded that metacognition plays an important role in regulating and controlling one's cognitive processes during learning and thinking, which leads to increased effectiveness and efficiency.

▪ METHOD

The research method used in this study is a quasi-experimental method. The research design used in this study was in the form of a non-equivalent control group design. In this design, the experimental group and the control group were not randomly selected. In this study, two classes were involved, namely experimental class A and control class B, which were given different treatments to determine students' metacognition obtained from this application. The research was carried out at X MA Baitussalam in the second semester of the 2021–2022 academic year. In this research, 28 students from each teaching session were used as a sample of 56 students. The instruments used in this study were questionnaires, observation, and documentation. The number of question items in this study were 30 questions consisting of 6 indicators. These indicators include 1) Declarative knowledge, 2) Procedural knowledge, 3) Conditional knowledge, 4) Planning (planning), 5) Monitor, and 6) Evaluation. The metacognitive ability questionnaire grid uses the theory of Desmita and Seto Mulyadi, covering metacognitive knowledge. Data analysis techniques used in this study include homogeneity tests, normality tests, and hypothesis testing.

▪ RESULT AND DISSCUSSION

After using the Jigsaw method to complete the learning process, the researcher collected data about students' metacognitive growth. A total of 56 students from class A and B took part in this study. Jigsaw learning was used experimentally in Class A, while traditional learning was used in Class B. All participants in this research consisted of two classes who were research subjects filling out the provided questionnaire and following the learning process to completion. Therefore, a total of 56 students participated in the research activity.

Categories can be determined by calculating the average of the pretest and posttest results in the control and quasi-experimental classes consisting of minimum, maximum and mean values. The following is the average value of students' metacognition pretest

and posttest results which were determined through statistical analysis using SPSS version 22 :

Table 1. Mean score of students' metacognition pre-test and post-test results

Groups	N	Mean	Std. Deviation	Std. Error Mean
Eksperimen	28	7.643	.6215	.1174
Kontrol	28	6.286	.7629	.1442

The table shows that the average metacognitive value of the control class students is lower than the treatment class, namely 7.643 in the treatment class and 6.286 in the control class. When viewed from the standard deviation value, the control class is higher than the experimental class, namely 0.1442 for the control class and 0.1174 for the treated class. From these data it shows that the application of the Jigsaw learning model shows that the control class has more variations compared to the experimental class. To test the hypothesis, tested using the Independent Sample T-test. The following are the results of hypothesis testing in this research:

Table 2. Hypothesis test results

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.783	.380	7.298	54	.000	1.3571	.1860	.9843	1.7300
Equal variances not assumed			7.298	51.879	.000	1.3571	.1860	.9840	1.7303

Based on the table above, the value of Sig. (2-tailed) is 0.000, which is less than 0.05. There is a significant metacognition difference between the quasi-experimental class and the control class because Sig. (2-tailed) smaller than 0.05. Thus, the final conclusion of the research or hypothesis is that there is a significant effect after the application of the Jigsaw Type Cooperative learning model on students' metacognitive abilities at MA Baitussalam.

Based on the results of the study, the use of the jigsaw learning model in the quasi-experimental class resulted in an increase in student metacognition. Therefore, it is possible to use learning strategies that use the Jigsaw method to improve student metacognition. Students are better trained to think critically and solve problems alone or in groups when the Jigsaw learning method is used. Students should also track the problem-solving process, assess how the strategy was implemented and whether it was used correctly, and do this until the problem has been fully resolved by the group.

Jigsaw learning techniques can also assist students in understanding concepts more fully and in tracking their thought processes. This is in accordance with research conducted by Nduji (2020) who found that the use of jigsaw-based cooperatives learning strategies are superior in increasing interest and achievement in learning physics students than the lecture method. Kumar (2017) also stated the same thing, if students were more active in learning after applying the jigsaw type cooperative learning method. Likewise with research conducted by (Isjoni, 2010) states that if cooperative learning is very appropriate compared to other learning models.

Based on the results of the research above, the Jigsaw learning approach is very good for increasing students' metacognitive awareness because they will understand the concept more fully. Since the previous introduction described metacognition as involving three types of knowledge: declarative knowledge, namely knowledge about oneself, knowledge about the factors that influence our learning process, skills, and strategies, procedural knowledge is knowing how to use the strategies we have, and conditional knowledge is knowing when and why to use these strategies in carrying out tasks, metacognition is very important. In addition, metacognitive awareness is used to control learning.

▪ CONCLUSION

Based on the discussion above, it shows that the mean (mean) metacognitive value of students in the control class is lower than the treatment class, namely 7.643 in the treatment group and 6.286 in the control group. The control class is higher than the treatment class when viewed from the standard deviation, with a difference of 0.1174 in the treatment class and 0.1442 in the control class. From these data it can be interpreted that there is an increase in student metacognition after the jigsaw learning model is feasible to apply. The application of Jigsaw learning in high school can provide an increase in students' metacognitive, according to the results of research and discussion (cognitive, affective and psychomotor). Therefore, the jigsaw type learning model is very appropriate to be applied in developing students' metacognition at MA Baitussalam.

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