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Application of Jigsaw Cooperative Learning Model to Improve Student's Learning Outcomes in Human Excretion System Materials in SMA Private Kemala Bhayangkari-2 Rantauprapat

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Abstract

The purpose of this study was to improve student learning outcomes in class XI MIA at SMA Private Kemala Bhayangkari-2 Rantauprapat on the material of the human excretory system by applying the jigsaw cooperative learning model. The population in this study were all students of class XI MIA which consisted of four classes with a total of 120 students and the sample in this study was class XI MIA-2 (Control class) which consisted of 30 students and class XI MIA-3 (Experimental class) amounted to 30 students. . Sampling in this study using random sampling (randomly). The data collection technique in this study was using a pretest (pretest) and a final test (posttest). From the research conducted, student learning outcomes in the control class experienced a considerable change in the average value, where in the initial test the average value was 38 and in the final test the average value was 76. Meanwhile, student learning outcomes in the experimental class experienced a significant increase significant where in the initial test the average value is 38.5 and in the final test the average value becomes 85. The results of this study indicate that the jigsaw cooperative learning model can improve the learning outcomes of biology students in learning materials of the human excretory system.

Keywords
Jigsaw cooperative; learning outcomes; excretion.

I. Introduction

Education is the most important part of development. Where the mission of education is to educate the nation's life, the intention is to prepare and build the aspired future, by creating quality education so that a person is able to succeed in the present and future development. (Bahi, 2016) Education is a very important human need because education has a duty to prepare Human Resources (HR) for the development of the nation and state (Pradana et al, 2020). According to Astuti et al (2019) Education is an obligation of every human being that must be pursued to hold responsibilities and try to produce progress in knowledge and experience for the lives of every individual. Education is one of the efforts to improve the ability of human intelligence, thus he is able to improve the quality of his life (Saleh and Mujahiddin, 2020). Education is expected to be able to answer all the challenges of the times and be able to foster national generations, so that people become reliable and of high quality, with strong characteristics, clear identities and able to deal with current and future problems (Azhar, 2018). Education and skills are the main keys in gaining social status in community life (Lubis et al, 2019).

The development of science and technological progress requires quality human resources who are able to compete with other nations. Human Resources are the main

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component and determinant of success and failure in an educational institution (Hasnadi, 2021)

In higher education, the low learning achievement that has been achieved by students depends on the teaching and learning process, namely what learning experiences have been understood by students. (Nahar, 2016). In learning, it is not only emphasized on the material, but also to develop the potential of students, namely the way of thinking about the material being taught(Andriani et al., 2015).

Learning is a process of interaction between students and teachers in teaching and learning activities that exchange information or provide information to each other (Kahar et al., 2020). In the teaching and learning process students are not only told but to find out (Yuliana et al., 2018). Every school expects a learning process that can build students' potential (Juliartini & Arini, 2017)

To create a learning atmosphere and learning process so that active students are able to develop their potential, and to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by themselves, as well as the nation and state. Because someone who has quality can be seen in terms of education. Where one of the things that affects a child's future is the education given to him (Lion, 2021).

In learning the teacher is able to create an active learning atmosphere and not monotonous and able to improve student learning outcomes. Therefore, the learning model is one that can affect student learning outcomes. Therefore, the learning model is a component that must be used in the teaching and learning process (Augustini, 2019). As educators, they are required to have the ability to choose and apply learning models that are suitable for certain materials and the abilities of their students (Suparman et al., 2014). One of the learning models is jigsaw cooperative where the learning model is a learning model that makes students more responsible for their respective tasks.

The jigsaw cooperative learning model is very helpful for students in solving problems and this model is not only for understanding the material but also makes students develop abilities and work together in groups, dare to express opinions and be responsible.(Karsidi et al., 2013). Where during the learning process all students have their own responsibilities that will be accepted even though they are in the form of groups (Trisianawati et al., 2016)

Based on initial observations at SMA Private Kemala Bhayangkari-2 Rantauprapat, information was obtained that the learning process is still relatively monotonous, interaction between teachers and students does not occur, only teachers play an active role, while students are less responsive to teachers. The teacher has tried to involve students, but students only accept what the teacher says. Conditions like this can be seen in the learning process, there are some students who are noisy, talk with their classmates, often go in and out, and some are just silently watching the teacher explain the learning material. In addition, the use of learning models when learning has not varied and is still lacking in utilizing learning models.

Information from one of the biology teachers at SMA Private Kemala Bhyangkari-2 Rantauprapat, the inactivity of these students has an impact on learning outcomes for biology for the excretory system material is relatively low. The low learning outcomes are because some students are less active in following the lesson, this can be seen by many students who are sleepy when learning takes place, chatting with their classmates, and some even scribbling on blank papers without paying attention to the teacher. Several efforts have been made by the teacher to improve student learning outcomes, especially the excretory system material, namely by providing tasks that are done both at home and at

school but have not shown any change, even though there are still scores below the KKM 75.

Based on the problems above, the researcher wishes to conduct a study entitled "Application of the Jigsaw Cooperative Learning Model to Improve Student Learning Outcomes on Human Excretion System Material at SMA Private Kemala Bhayangkari -2 Rantauprapat".

II. Research Method

This research was conducted at SMA Private Kemala Bhayangkari-2 Rantauprapat, in November-December 2021. The population in this study were all students of class XI MIA, there were four classes with a total of 120 students. The sample in this study was class XI MIA-2 as the control class with 30 students and class XI MIA-3 as an experimental class with 30 students. Sampling in this study using random sampling (randomly). This type of research is quantitative research. The data collection technique in this study is by means of a test which will be carried out 2 times, namely the initial test (Pretest) and the final test (Postest). The initial test aims to determine the initial ability of each student. The final test aims to determine the results achieved by students after the teaching and learning process takes place. The instrument in this study is in the form of questions consisting of 30 multiple choice questions. The questions were distributed during the pretest and posttest. The results of the pretest and posttest will be the data on student learning outcomes on the excretory system material.

III. Result and Discussion

3.1 Deconstruction Social View Towards Woman

Learning outcomes data in this study were obtained from the results of the pretest and posttest results. In the control class, the learning process uses the conventional learning model, where the teacher only applies the lecture model. In the experimental class, the learning process is carried out using the jigsaw cooperative learning model. Then both classes were evaluated to see changes or improvements in student learning outcomes. In the control class the data was taken from the results of the pretest and posttest without treatment where the control class used the conventional learning model, namely the teacher only applied the lecture model. The data can be seen in the following table.

Table 1. Pretest and Posttest Learning Outcomes in the Control Class

Learning model	Data source	Learning outcomes		
		The highest score	Lowest Value	Average
Control (Conventional)	**Tes Awal (Pretest)**	**60**	**15**	**38**
	Tes Akhir (Postest)	**80**	**70**	**76**

Based on Tebel. 1 it can be seen that in the Control class the learning model used is the conventional learning model with the highest score on the initial test (Pretest) which is 60 and the lowest score is 15 with an average value of 38, this value has not reached the Minimum Completeness Criteria (KKM). Meanwhile, in the final test (Posttest) the highest

score was 80 and the lowest score was 70 with an average score of 76. Of the 30 students only 12 people scored above the KKM and the rest were still incomplete, because this control class the teacher only applied the learning model just talk. In the control class there was a change in the average value from 38 to 76. This change was still not optimal because learning was still teacher-centered, where the teacher only explains with a lecture model without asking students to take any action. And students only get information from the teacher without knowing it from other sources. Likewise, there are some students who pay attention to the teacher and there are some students who don't want to know what the teacher is teaching or explaining at all. This conventional learning model is still widely used by teachers at the school. The comparison of the average value of student learning outcomes in the control class can be seen in Figure.1 this conventional learning model is still widely used by teachers at the school. The comparison of the average value of student learning outcomes in the control class can be seen in Figure.1 this conventional learning model is still widely used by teachers at the school. The comparison of the average value of student learning outcomes in the control class can be seen in Figure.1

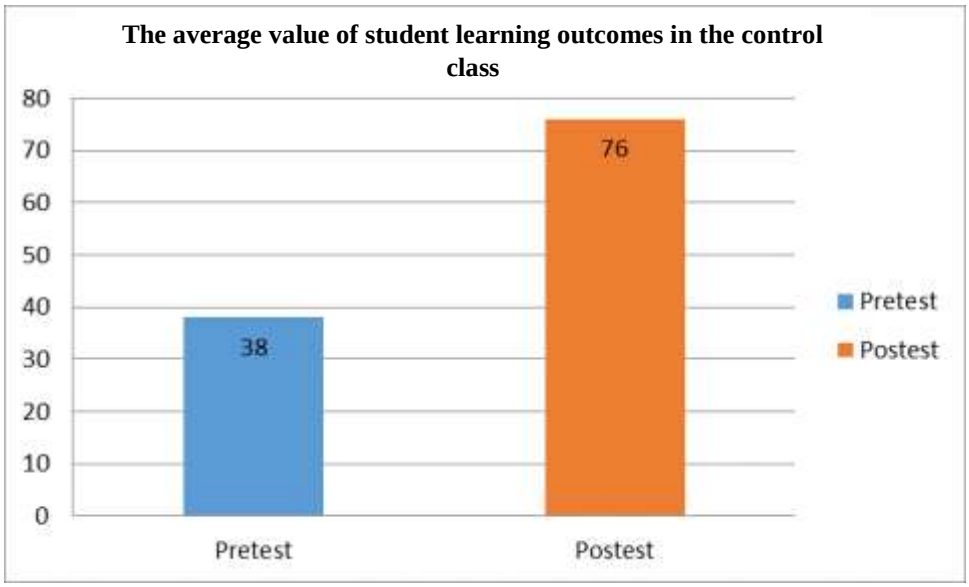

Figure 1. *Graph of Comparison of the Average Value of Student Learning Outcomes*

Based on Figure 1 above, it can be seen that student learning outcomes in the control class have an average score that has not increased significantly. Where out of 30 students only 12 students scored above the KKM and the rest got scores below the KKM or were incomplete. This control class still uses the conventional model which is still centered on the teacher and learning is still very monotonous, there is no interaction between teachers and students.

If the conventional learning model does not improve student learning outcomes, motivation, attention and learning media can also improve student learning outcomes. With motivation, students will be encouraged to continue to study harder in order to achieve the maximum possible results, and attention also affects student learning outcomes. The teaching materials that we describe must be able to attract the attention of students if the teaching materials do not become the attention of students it will make the teaching and learning process bored. In addition to media attention and motivation, it can also improve student learning outcomes, with the existence of learning media, the learning atmosphere becomes more interesting and not monotonous.

In the experimental class, the pretest data was given before the students were treated using the jigsaw cooperative learning model and the posttest results were given after the students were treated using the jigsaw cooperative learning model. The data can be seen in the following table.

Table 2. Pretest and Posttest Learning Outcomes in Experiment Class

Learning model	Data source	Learning outcomes		
		The highest score	Lowest Value	Average
Experiment (Cooperative Jigsaw)	Initial Test (Pretest)	50	20	38.5
	Final Test (Posttest)	95	75	85

Based on Table. 2 it can be seen that in the Experimental class the highest score was obtained in the initial test (Pretest) which was 50 and the lowest score was 20 with an average value of 38.5, while the highest score in the final test (Postest) was 95 and the lowest score was 70 with an average value. The average value is 85. From the data obtained, there is an increase in the average pretest and posttest scores for biology class XI MIA students on the Excretion system material at Kemala Bhayangkari-2 Private High School Rantauprapat which shows an average score of 38.5 increasing to 85, with a difference in the average value of 46.5. Where in this experimental class consists of 30 students and only 2 people who have not completed and get a score below the KKM. In this experimental class, the teacher uses the Jigsaw Cooperative learning model in which learning is centered on students, so they do not expect what is explained or delivered by the teacher, but the students themselves must seek more information from various sources so that the lessons taught are easier. The comparison of the average value of student learning outcomes in the experimental class on the material of the human excretory system using the jigsaw cooperative learning model can be seen in Fig. 2

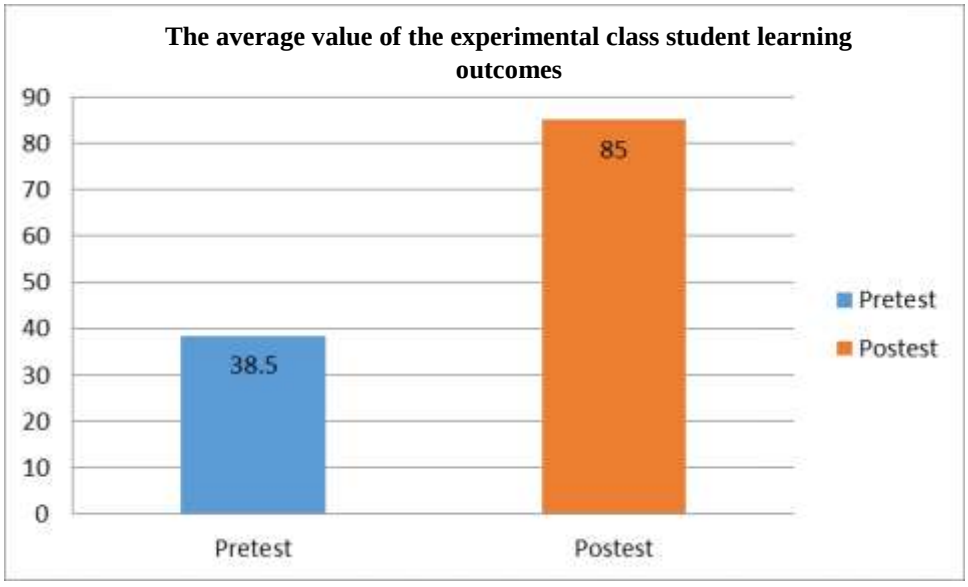

Figure 2. *Graph of Comparison of the Average Value of Student Learning Outcomes*

Based on Figure 2 above, it can be seen that, student learning outcomes in the experimental class have increased the average value by applying the jigsaw cooperative learning model to the human excretory system material for class XI-Mia at Kemala Bhayangkari 2 Private High School Rantauprapat. Where the jigsaw cooperative learning model teaches students to work together in teams and learn from each other between groups, communicating with each other without feeling awkward.

The jigsaw cooperative learning model can help students understand the material and be free to think and have a positive effect on students in carrying out learning activities in understanding the material(Wahyuni, 2018). According to research conducted by(Aeni et al., 2017)Jigsaw cooperative learning model is a model that is able to train students' communication skills.

This is ultimately the application of the cooperative learning model*jigsaw*effect on student biology learning outcomes on the material of the human excretory system at the Private High School Kemala Bhayangkari-2 Rantauprapat. And the research done(Siregar, 2018)also stated that the jigsaw cooperative learning model in classroom action can improve biology learning outcomes in the digestive system material at SMA Negeri I Torgamba.

This is in line with research(Mbambuk et al., 2019)which states that the learning outcomes of biology students with the application of cooperative learning models*jigsaw*very significant effect on the material sense system in humans class XI MIA SMA (SLUA) Saraswati 1 Denpasar. Likewise with research(Hasanah Siti, 2018)where the jigsaw cooperative learning model is very influential in increasing student activity and creativity in learning the cell excretion system in class XI IPA-1, SMA Negeri 1 Cikalongwetan.

IV. Conclusion

Based on the results and discussion obtained, it can be concluded that the learning outcomes of Biology students of class XI MIA SMA Swasta Kemala Bhayangkari-2 Rantauprapat, in the control class, the average score on the initial test was 38 and in the final test the average value of 76 the changes were not optimal because it still uses conventional learning models / lectures. After applying the jigsaw cooperative learning model, there was a significant change in the average value, namely in the initial test an average value of 38.5 was obtained and in the final test an average score of 85. This learning model greatly influences student learning outcomes and student activity in expressing opinions. , so that this can encourage an increase in student learning outcomes in Biology lessons.

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