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Jigsaw Type of Cooperative Learning Model to Increase Learning Outcome in Learning Principal Science: Composition of Human and Animal Respiratory Organs

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ABSTRACT

This research is motivated by the low value of science subjects at SDN 100 Kendari which is caused by the science learning process that has been carried out so far still applying traditional learning patterns. Based on the above background, the following problems are formulated: (1) How is the application of jigsaw type cooperative learning in increasing mastery of concepts on the subject of Human and animal respiratory organ structure for fifth grade students at SDN 100 Kendari and (2) Can the application of the jigsaw type cooperative learning model improve science learning outcomes for fifth graders at SDN 100 Kendari? This study aims to: (1) Increased student reasoning skills class V SDN 100 Kendari material Milk nan respiratory organs of humans and animals use jigsaw type cooperative learning model; (2) Improved learning outcomes of fifth graders at SDN 100 Kendari on the subject of human and animal respiratory organ structure using Jigsaw cooperative learning ; and (3) Increasing the ability of teachers to guide students by applying the jigsaw type cooperative learning model in studying the composition of human and animal respiratory organs at SDN 100 Kendari.

This type of research is classroom action research, as a research procedure that produces descriptive data in the form of written or spoken words from observable evaluation results. The population of this study was the fifth-grade students of SDN 100 Kendari, totaling 28 people. The results obtained indicate that the application of the jigsaw type cooperative learning model can improve the learning outcomes of fifth grade students at SDN 100 Kendari for science subjects. The achievement of performance indicators has been achieved where the classical average in the first cycle reaches 73.23 and the percentage of classical completeness is 77. .93, while in the second cycle there was an increase where the classical average had reached 78.57 and the classical completeness percentage had reached 82.14. Based on this, the performance indicators in this study are the classical average of 75 and the classical percentage of success is 80%.

Keywords: *Jigsaw, Respiratory organs, Learning outcomes.*

I. INTRODUTION

Improvement of the quality of human resources is always strived for renewal, especially in the world of education. This is intended so that the development developed in this country can run according to the expected targets in education planners. In line with that, many changes occur in the world of education, especially in curriculum development, learning strategies, media, forms of evaluation to the development of the learning process in the classroom.

The school is the main unit in the management of the educational process, in that school the teaching and learning process occurs, namely the maturation process that involves students and teachers as the main component in developing children's potential. Besides that, there are many supporting components that contribute to the progress of children's learning processes at school.

Towards the end of the first five-year long-term development period, we are becoming increasingly aware of our shortcomings with regard to development in the field of education. One of the shortcomings lies in the core of the educational activity itself, namely the learning process. According to Conny (1985: 14) there are still many teachers in the learning process who treat students with a way of learning known as Sit, Listen, Record and Memorize (DDCH). Knowledge capital for students is absolutely necessary to be able to take part in the age of

knowledge. Mastery of knowledge requires reasoning ability, interest and high motivation to learn, so all three really need to be developed in the learning process at school.

The results of discussions between prospective researchers and several science teachers at SDN 100 Kendari, obtained information that the science learning process carried out so far has always applied traditional learning patterns so that student learning outcomes are very low. In addition, students' interest and motivation in learning are still low. The delivery system is dominated by teachers whose teaching style tends to be authoritarian and instructive, and the communication process is one-way.

Learning material, the composition of the respiratory organs of humans and animals carried out in class V at SDN 100 Kendari has so far implemented a process skills approach, but in its implementation, maximum results have not been obtained. This is evident from the results of daily tests in the last two years, about 50% - 60% of students have not achieved a score of 65 as the standard of learning completeness set by the school at 75%.

One of the factors suspected to be the cause is that the learning system carried out by the teacher is less varied, which is merely learning done by the lecture method without paying attention to the more appropriate learning method so that the results are less than optimal, the method is monotonous. In this case, Syaiful (1996: 27) states that the method is a means of external stimulation that can arouse one's learning.

To overcome these problems, as a science teacher, you should look for appropriate learning innovations. On that basis, the researcher is interested in examining it in a study entitled: Application of the Jigsaw Type Cooperative Learning Model in Natural Science Learning. The composition of the respiratory organs of humans and animals can improve the learning outcomes of fifth grade students at SDN 100 Kendari.

II. LITERATURE REVIEW

a) Understanding Learning

Learning in school is the core of the educational process at school. Learning is the main tool for students in achieving learning objectives as an element of the educational process in schools. While teaching according to Hadith (2006: 59) is the main tool for teachers as educators and teachers in achieving learning objectives as an educational process in the classroom. Further said by Sutikno (2005: 135) that learning is a necessity in human life, just as important as work, and friends, and a way of adaptation of man's ultimate, if we do not learn it cannot survive, and we would certainly it just won't work either. Learning is complex and covers many aspects of life. All human activities have a learning dimension. Learning is carried out continuously, informally, with different *settings,* in a family environment, filling leisure time, through community activities, and every practical activity. Then Hamalik (2008: 29) said that learning is not a goal but a process to achieve the goal. So, are the steps or procedures taken.

Slameto (1988: 2) suggests that: learning is a process of effort carried out by individuals to obtain a new behavior change as a whole, as a result of the experience of the individual himself in the interaction of the individual with his environment. Moeslicatoen (1989: 1) continued that learning can be interpreted as a process that makes the learning process happen and the change itself is generated from the effort in the learning process. Then Hamalik (2001: 27) gives the definition that learning is the modification or strengthening of behavior through experience (learning *is defined as the modification* or strength of the behavior through *experiencing).* One's learning process can be influenced by the internal factors of the students themselves and external factors, namely the setting of learning conditions. The learning process occurs because short-term and long-term human synergies are activated through the creation of external factors, namely learning or the learning environment through their senses, students absorb material differently. Gane, et al in Prawira Dilaga (2012: 4) say that the teacher directs that information processing for long-term memory can take place smoothly.

b) Definition of Teaching

Teaching is essentially an effort to create conditions or environmental systems that support and enable the learning process to take place (Sardiman, 1990:47). If learning is undertaken by students, while teaching undertaken by teachers as teachers and educators in the classroom.

Teaching can be broadly defined as an organize and arrange the environment as well as possible and link up with the child, resulting in a process of learning. Teaching can also be interpreted broadly, namely efforts to create conditions conducive to ongoing learning activities for students. These conditions are created in such a way as to help the child's development to the maximum and optimally, both physically and spiritually.

c) Cooperative Learning concept

The term *Cooperative learning* in Indonesian discourse is known as cooperative learning. This term means more than just traditional group learning which forms work groups with a positive environment and eliminates individual competition within groups for academic achievement. The concept of *cooperative learning* is not a new concept but has been known since the first century AD, when the ancient Greek philosophers suggested that in order for someone to learn, he must have a learning "partner". This implies that someone in carrying out learning activities requires friends or learning partners.

C*ooperative learning* can also be interpreted as a motive of cooperation, where each individu faced with the choice that must be followed if prefer cooperation, competence, or individualistic. The use of *cooperative learning* model according to Stahl (1994: 25) is an approach in the learning process that requires participation and

cooperation in groups. *cooperative learning* can improve student learning towards a better, helpful attitude in some social behaviors.

d) Characteristics and Principles of Cooperative Learning

Characteristics are behaviors that appear and become the nature or character of cooperative learning activities. Slavin said that cooperative learning has certain characteristics that distinguish it from other learning and these characteristics can be described as follows:

a. *Refers to group success: Group* success is the group's victory in a competition in a learning activity (such as the Jigsaw type). Group success is achieved jointly by all group members.
b. *Emphasizing the role of members:* Each member in the group has clear duties and functions, meaning that group members act as motivators, peacemakers, movers, decision-makers, or formulators.
c. *Relying on sources or materials: the* resources or materials to be studied are divided equally for each member of the group. The intended learning materials are in the form of reading materials or student worksheets (LKS) relating to the subject matter to be taught.
d. *Emphasize interaction:* Each group member interacts face-to-face in a focused group and calls friends by name.
e. *Prioritizing individual responsibility:* Group victory depends on individual learning outcomes on understanding the learning material. Each group member guides each other towards learning materials that have not been understood. After all group members understand the learning material, group members are ready to take a test (quiz) at the end of each meeting.
f. *Creating opportunities for mutual victory:* Each student contributes to the group in the form of the value of his learning outcomes. This can be done by means of each member of the group trying to get the best value,
g. *Prioritizing personal relationships:* All group members need to get along with each other and help each other in group learning,
h. *Emphasis on shared leadership:* Each student has the right to speak and have their own work. The teacher acts as a mentor (Tutor) at any time the learning takes place, and
i. *Emphasize group assessments or rewards:* Group ratings are given on joint efforts with group members and group rewards are usually given when a group wins or wins an inter-group game.

As a learning model, cooperative learning is raised with several principles. Lungren introduces 7 (seven) principles of cooperative learning in which each student must (1) have the perception that they are sinking and swimming together; (2) have responsibility for each other student in the group in addition to responsibility for themselves in studying the material at hand; (3) hold the view that they all have the same goal; (4) dividing tasks and sharing responsibilities equally among group members ; (5) giving rewards so that each member is motivated to complete group assignments; (6) carry out joint leadership while working and learning to gain skills , and (7) students will be asked to individually account for the material handled in cooperative groups .

In addition to studying the cooperative activities of others, students are required to cooperate effectively in learning, especially in learning science. Facilitators and mentors are expected to be able to organize group assignments and provide guidance to students so that they can conduct in-depth collaborative studies with others. In this process students can actually be involved and master/understand cooperative behavior, attitudes and abilities effectively.

e) Definition of Jigsaw

The word Jigsaw is taken from English as a noun which means a piece of mosaic/pattern. So, jigsaw is a pattern or learning model where students will be divided into several groups with heterogeneous characteristics in terms of academic ability or social status, ethnicity. Academic material will be presented to students in the form of a test, and each student will study one part of the academic material as his responsibility.

The jigsaw concept has been developed and piloted by Elliot Arronson and friends at the University of Texas. Then adapted by Slavin and friends at Johns Hopkins University in Muslim Ibrahim, et al. (2000: 11) this method is the right method and has been tested in learning, so it is also applied by teachers in schools.

f) Relevant Research Results

Various studies on cooperative learning models with relevant jigsaw techniques have been carried out, including:

Aswati (2002: 14) Improving the quality of learning by using the jigsaw technique at SMP Negeri 9 Kendari. This study gives the result that improving the learning process applied through the jigsaw technique can turn an inactive learning atmosphere into an active one. Sukisno (1998) in his research suggests that the cooperative learning model is a model that can optimize student learning outcomes. The learning structure is organized in such a way as to be cooperative and the active role of students in learning is the dominant activity and teaching and learning activity, and the evaluation of learning emphasizes the process rather than the results. The application of the cooperative model also requires students and teachers to interact with each other, cooperate in solving problems in learning.

I Wayan Lasmawan (1997) in his research concluded that the jigsaw type of cooperative learning has a fairly high effectiveness, can improve student learning achievement in relation to mastery of material, attitudes, social skills, create a climate and atmosphere of teaching and learning for students who are active and interactive, increasing

excitement, motivation, mastery of the material, and intimacy between students and students and students and teachers (*research results in one of the elementary schools in Bali)*

Milwan (2004: 19) found that the achievement of student learning outcomes in the jigsaw cooperative learning group showed an increase in learning outcomes. This increase in learning outcomes is caused by the seriousness of students in participating in learning. This sincerity is also supported by relevant learning models, so they are very enthusiastic in participating in learning. In learning the Jigsaw Technique in Tanjung Toronipa there will be social interaction that can build students' cognitive because learning occurs when students work on the tasks given, students work together in groups, discuss and exchange ideas so that it is easier for students to understand the concepts being taught.

III. RESEARCH METHOD

a) Research Time and Place

The research was conducted on Class V SDN 100 Kendari, odd semester in learning 2018/2019. This research was carried out in collaboration with 2 teachers. The implementation of this research activity was carried out for 30 days. The students who were the target of this research were 28 students consisting of 11 male students and 17 female students with almost the same level of academic ability as well as their social and economic conditions.

b) Factors that Di conscientious

Some of the factors that are targeted or that want to be examined in this research are:

1. Student Factor

There are two factors that become the target of this research for students, namely: (1) The level of understanding of the concepts of the composition of the respiratory organs of humans and animals (2). The ability of students to implement existing learning strategies.

2. Teacher Factor

The target expected by the teacher in this study was the readiness of the subject matter, using learning strategies oriented to jigsaw cooperative learning and organizing students in the learning process. This can be reflected in the teacher's ability to carry out the core scenario and the closing stage.

3. Research Action Plan

The guidelines/procedures for the implementation of this research refer to the details of the implementation of the research actions proposed by Ridwan. S (in Anonymous, 2004) states that the details of classroom action research procedures consist of:

a. Action Preparation
b. Action Implementation
c. Observation and Evaluation
d. Analysis and Reflection

c) Performance / Success Indicators

Performance indicator / success in this action research is if the level of understanding of students' concepts which is the result of student learning in learning activities on the material Arrangement of human and animal respiratory organs in class V SDN 100 Kendari achieves classical completeness of 80% and an average value of 75.

IV. RESEARCH AND DISCUSSION

a. Results

The data analysis used in this research is descriptive data processing, namely the average and percentage. The type of data that is broken down is the achievement of learning effectiveness using the Jigsaw cooperative learning model (processing the results of observations by collaborative colleagues and students) and student learning outcomes in the form of evaluation data in each cycle.

1. Application of Jigsaw Type Cooperative Learning Model on the subject of human and animal respiratory organ structure.

What researchers do in teaching the basic material of the structure of the respiratory organs of humans and animals by using a jigsaw cooperative type is first to develop programs, namely various teaching preparations or called learning tools starting from annual programs, quarterly programs, Study Material Analysis (AMP), Plans Learning (RP), Lesson Unit (SP), LKS and teacher teaching materials/materials.

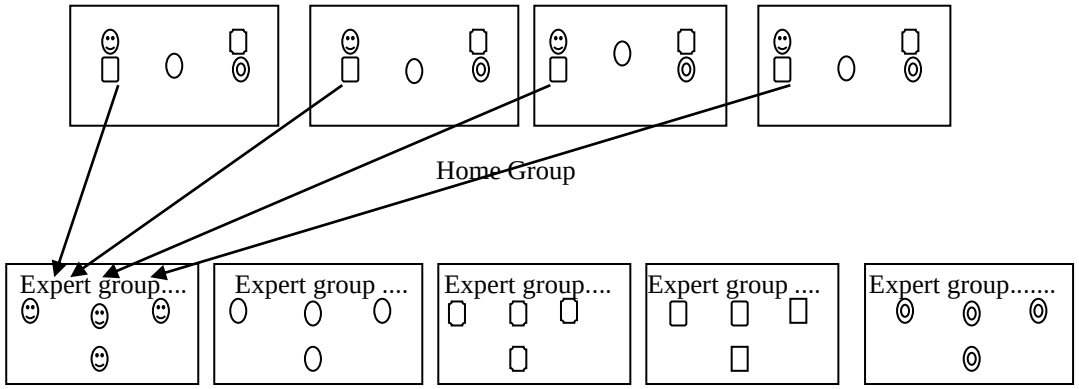
To carry out the preparation in this jigsaw type of cooperative learning, the researcher conveyed the procedures for dividing groups, dividing students into cooperative groups, formulating aspects or problems to be investigated, determining the schedule of activities. The material presented in this study is designed in such a way as to suit the form of learning held in groups.

a) Group activity stage

The steps for this group activity are as follows

a. Students are divided into 5 members of heterogeneous study groups and this group is called the home group.
b. Ask students things related to the material to be taught.
c. Revealing something that can arouse student learning motivation

d. Each person in the team was given a different material which contained several questions about the composition of the respiratory organs of humans and animals to each group (original group).
e. Each person in the home group forms a group leader and distributes the material to be discussed to the expert group.
f. Members of different teams who have studied the same section/sub-chapter meet in a new group (expert group) to discuss the problems they have shared.
g. After finishing the discussion, part of the expert team, each member returned to the home group or met and then discussed homogeneous problems and took turns teaching their teammates about the sub-chapters they mastered and each other member listened intently, other students provided input on the expert team's opinion. in the group in the form of additional ideas, ideas, opinions that exist. And so on until each team of experts in the group get back their part of the task.
h. A Members of the team of experts back to the original group and teach what they have learned and discussed in an expert group to be transmitted to the group of their own friends. This can be seen in the following image



Expert group

i. Each expert team presents the results of their discussion.
j. The teacher and students discuss in making conclusions
k. The teacher conducts a learning evaluation
l. The teacher gives homework and a learning evaluation.

b. Learning evaluation stage

After the subject matter of the composition of human and animal respiratory organs in science subjects was discussed in groups with the Jigsaw type, a learning evaluation was carried out. The evaluation in question is an activity to test the success or weakness of the learning process after students follow the teaching program that we provide.

In this learning evaluation, the teacher prepares a quiz or question for students to answer. Each student's answer or study group will be scored by the teacher. This scoring takes the form of scoring each individual in the group. The quizzes or questions used are in the form of essays and objective choices.

c. Findings about the advantages and disadvantages in the application of the jigsaw type cooperative learning model

The learning model is a technique or method used by a teacher in designing cooperative learning groups according to the subject matter in each subject. Not all learning models are suitable for all subjects, but all learning models can be carried out by a teacher in each subject, but it is important to know that each learning model has advantages and disadvantages in the learning process. The jigsaw type has its own uniqueness, namely it has two group names, namely the origin group and the expert group. The results of this study indicate that learning using cooperative jigsaw types has advantages, namely that in the learning process the subject of the composition of human and animal respiratory organs , students have seriousness in participating in learning, so they are very enthusiastic in participating in learning, this type of jigsaw cooperative allows students to be able to social interaction that can build students' cognitive because learning occurs when students work to handle the tasks given, students work together in groups, discuss and exchange ideas making it easier for students to understand the concepts being taught. The disadvantage of this type of jigsaw is that in the learning process students are a bit noisy in looking for their group, but this noise does not interfere with the process, so here the teacher is required to be able to supervise in a fun way.

2. The application of the Jigsaw Type Cooperative Learning Model Can Improve Learning Outcomes on the subject of the respiratory organ structure of humans and animals.

In This chapter describes the findings of the application of the cooperative jigsaw regarding the teaching and learning process, results of observations made by peer collaboration to the activities of students in effective

learning in cycle 1 and II, S Elain student activities, peer collaboration also made observations of a teacher's ability to streamline learning through the implementation of cooperative jigsaw using Linkert scale.

a. Implementation Cycle I No Activity Learning Process

The implementation of the first cycle was carried out in two meetings for the use of a Teaching Program Plan (RPP) concerning the material of human and animal respiratory organs. Cycle I was held on Monday, January 7, 2019 and Monday, January 14, 2019. Prior to the implementation of the first cycle, preliminary activities were carried out in the form of introducing the jigsaw cooperative learning model technique and giving group assignments to be used during the next learning in the form of social values and norms. The results of observations made by collaborative colleagues on student activities in making learning effective in cycle 1 can be seen in the following table.

Table 1. Percentage of Student Activities in Streamlining Type (Technique's jigsaw in Cycle I.)

No	Observation Aspect	Percentage (%)
1.	Students' understanding of the subject matter	81.25
2.	Student collaboration in groups	87.50
3.	Asking questions (at presentation or at the teacher)	81.25
4.	Understanding of learning scenarios	75.00
5.	Ability to respond to objections / questions	75.00
6.	Problem solving ability	87.50
7.	A pleasant learning atmosphere for students	87.50

Based on table 1, it can be seen that student activities in learning have reached 75% - 87.50%. However, understanding of learning scenarios and students' ability to respond to objections/questions has not been maximized, which is only 75%.

In addition to student activities, collaborators also observed the teacher's ability to make learning effective through the application of a jigsaw type cooperative using the Linkert scale. The results of these observations are shown in the following table:

Table 2. Average Percentage Capability Teachers in Making Learning cooperative jigsaw in Cycle I.

No	Aspects Observed	Data analysis	
		Average	percentage
A. Introduction			
1	Preparing students for learning	3.50	87.50
2	Motivate students to take lessons	3.50	87.50
3	Presenting a problem to students related to the subject matter discussed	3.50	87.50
4	Delivering basic competencies and learning indicators	3.50	87.5
	amount	**3.50**	**87.50**
B. Core activities			
1	Organizing students into study groups	4.00	100
2	Guiding students to conduct discussions/observations	3.50	87.5
3	Provide opportunities for students to ask questions.	3.00	75.00
4	Provide questions - questions about basic competencies and indicators of learning evenly.	3.25	81.25
	amount	**3.45**	**85.94**
C. Closing			
1	Guiding students in summarizing lessons	3.00	75.00
2	Giving conclusion	2.50	62.50
3	Reflection	3.25	81.25
4	Closing the lesson	3.50	87.50
	amount	**3.06**	**76.56**
D. Class Atmosphere			
1	Enthusiastic students	3.50	87.50
2	Enthusiastic teacher	3.75	93.75
3	Manage class well	3.25	81.25
4	Thank you for the right time	2.00	50.00
5	KBM According to the scenario in the RPP	3.00	75.00
	amount	**3.10**	**77.50**

Based on table 2, it can be seen that the ability in cycle I in conducting jigsaw cooperative learning in each learning activity is still not optimal. It can be seen that the percentage achievement of each activity aspect has not yet reached the range of 90 to 100%.

1) Student Learning Outcomes

The measurement of the success rate of students in the teaching and learning process which is the result of student learning is carried out through giving evaluations at each meeting then taking the average and determining the percentage of success in two forms of questions namely multiple choice and essay tests and the minimum standard of completeness is 65. For student learning outcomes V classes totaling 28 people in the first cycle for the base can be seen in the following table.

Table 3. Data on the results of achieving product goals in evaluation activities on the composition of human and animal respiratory organs

No	Indicator	Classical Learning Outcomes			Total Completeness	
		Total Value	Average	Percentage	Complete	Not Complete
1.	Mention the composition of human organs in full	2050,5	**7323**	73.23	22 students	6 students
2	Name the types of organs					
3	List the parts of the respiratory organs in animals in full.					
4	Distinguish human and animal organs					
	Percentage of classical completeness				**78.57%**	21.44%

The achievement of learning outcomes in the first cycle as shown in the table above, shows that classically the average learning outcomes of fifth grade students reached 73.23 and classical learning completeness reached 78.57%. This still does not meet the expected performance indicators.

2) Cycle I. Reflection Results

The advantages that were found during the researcher's actions were applied and developed as well as the weaknesses that the researchers found

corrected at the next meeting. The results of the reflection in cycle I can be described as follows.

a). Advantages

1). The effectiveness and participation of students during learning progressed when compared to before the CAR action.
2). Students show joy and seriousness during learning, especially in the spirit of learning which has an impact on the acquisition of the evaluation results given (the classical average at meeting 1 is only 68.07% while at meeting 2 it is 75.54%).
3). Students show discipline in doing assignments both individually in learning and in groups (on the recognition of students, there are groups that voluntarily seek to find sources of answers to assignments given to each group).
4). Researchers in preparing CAR facilities are quite good, which can be seen from the learning facilities displayed which are adapted to existing conditions and abilities.
5). Researchers have been able to operate the learning according to the scenario
6). Researchers have tried to improve their performance from the first meeting to the second meeting.
7). The material discussed is based on students' previous knowledge through observations and group assignments.
8). Researchers have provided meaningful motivation for students in the form of giving rewards to the best performing group.

b). Weaknesses and Action Plans

Weakness and plan corrective actions that have been pen e Liti carried out during the first cycle can be described in the following table.

Table 4. Implementation of Action Learning Cycle I

Weaknesses at the Meeting 1	Corrective Actions and Weaknesses at Meeting 2	Action Plan in Cycle II
Researchers are a little stiff (less relaxed) in carrying out learning when observed by collaborative colleagues	Researchers try to approach observers through discussions outside of PBM	Before carrying out the implementation of all learning needs carefully prepared.
Researchers do not expose k an indicator of successful learning	The researcher mentions the indicators of learning success at the beginning of the meeting	Announce and emphasize the group that did the best group work and the student who got the best score in the evaluation and gave simple and fun prizes.
At the first meeting, the researcher did not introduce the collaborative partners who were present in the class so that initially it caused confusion to the students	Introducing collaborative partners before the implementation of PBM, but it is seen that students still feel like they are being watched so that sometimes they are less relaxed in learning.	Divide students so that everyone gets a turn in the presentation
Student activity in solving problems in groups has not been evenly distributed so that there are students who expect their partners to solve existing problems.	Remind students that the aspect of cooperation in groups is the key to success in achieving the truth and the right time in solving problems, but there are still students who look indifferent.	Divide group problems into individual students so that students can be active
The use of time has not been well organized so that the available time has not been able to reach the learning scenarios made so that several stages of learning are carried out as if in a hurry	Detailing the time for each stage of learning, but in learning it is not optimal.	Pen e Liti should reconsider the breadth of activities and time allocation to be used.
RPP has no time details yet	Include details of time at the time of preparation of the next RPP, but the existing allocations have not been consistent at the time of implementation.	Placing the time allocation for PBM activities on the right side of the RPP
The assignments given to students for the next meeting were not clear due to time constraints.	Prepare the assignment script given to each group to be copied and worked on.	Prepare worksheets for each person so that at least one student can handle one different part of the assignment.
At the time of presentation, self and group identity is not clear.	Suggest to introduce yourself and the group at the time of presentation.	Prepare the observation sheet for the next meeting.
During the presentation, group members seemed passive in responding to questions/rebuttals.	Provide opportunities to respond to objections / questions to group members who are not present.	Give identity and serial number to each member of the group to facilitate the assessment of observations and assessments.
The time available for evaluation is not proportional to the number and level of difficulty of the questions.	Prepare evaluation sheets and answer sheets for students that are tailored to the learning objectives and available time allocation	Make an evaluation sheet by considering the time available.
The researcher forgot to end the lesson	End the lesson by saying hello Guidance is carried out from one group to another	Provide general guidance then guidance from one group to another
Guidance in solving problems in groups is not evenly distributed.	Giving questions based on groups with an even frequency.	
The teacher asks questions about basic competencies and the existing indicators are not evenly distributed	Giving the opportunity to ask students based on group representatives.	
The opportunity given to students to ask questions is not evenly distributed in each group.	Guidance summarizes the lessons carried out from one group to another	
Not all groups, researchers provide guidance in summarizing learning.		

b. Implementation of Cycle II in Teaching and Learning Process Activities

Implementation of the learning activities in the second cycle basically the same as the first cycle of activities, only a basic implementation of the results of reflection on the implementation of the second cycle I. cycles performed on Monday, 2 January 1st 2019 and January 28th 2019 in the material composition of the respiratory organs of

humans and animals. Prior to the implementation of cycle II, at the last meeting of cycle I students were given assignments related to learning in the cycle in the form of identifying human and animal respiratory organs obtained from various materials in science books about images of human and animal respiratory organs. The assignment is carried out in groups

The results of observations made by collaborative colleagues on student activities in making learning effective in cycle II can be seen in the following table.

Table 5. Percentage of Student Activities in Making Learning Effective jigsaw cooperative type in Cycle II.

No	Observation Aspect	Percentage (%)
1.	Students' understanding of the subject matter	93.75
2.	Student collaboration in groups	100
3.	Asking questions (at presentation or at the teacher)	93.75
4.	Understanding of learning scenarios	100
5.	Ability to respond to objections / questions	75.00
6.	Problem solving ability	93.75
7.	A pleasant learning atmosphere for students	100

Observations from aspect of the students in grade V in learning using cooperative jigsaw seen in Table 6, there are up to 100%, namely the cooperation of students in the group, understanding learning scenarios and a fun learning environment on students. However, the ability to respond to objections / questions only reached 75%.

Observations on the ability of teachers to make learning effective through the application of jigsaw cooperative types in cycle II using a Likert scale, are shown in the following table:

Table 6. Average Percentage of Teacher Ability in Effectiveness Jigsaw cooperative learning techniques in Cycle II.

No	Observation Aspect	Data analysis	
		Average	percentage
A. Introduction			
1	Preparing students for learning	4.00	100
2	Motivate students to take lessons	3.75	93.75
3	Presenting a problem to students related to the subject matter discussed	4.00	100
4	Delivering basic competencies and learning indicators	4.00	100
	amount	3.75	93.75
B. Core activities			
1	Organizing students into study groups	4.00	100
2	Guiding students to conduct discussions/observations	4.00	100
3	Provide opportunities for students to ask questions.	4.00	100
4	Provide questions - questions about basic competencies and indicators of learning evenly.	4.00	100
	amount	4.00	100
C. Closing			
1	Guiding students in summarizing lessons	3.75	93.75
2	Giving conclusion	4.00	100
3	Reflection	4.00	100
4	Closing the lesson	4.00	100
	amount	3.75	93.75
D. Class Atmosphere			
1	Enthusiastic students	4.00	100
2	Enthusiastic teacher	4.00	100
3	Manage class well	3.75	93.75
4	Appropriate time allocation	4.00	100
5	KBM According to the scenario in the RPP	4.00	100
	amount	3.75	93.75

Based on table 6, it can be seen that the teacher's ability according to observations made by collaborative colleagues in preliminary activities reached 93.75%, Core Activities 100%, Closing Activities 93.75% while the atmosphere developed in the classroom reached 93.75%.

1) Student Learning Outcomes

The achievement of performance indicators to be achieved through the learning outcomes of students in class V on the implementation of learning cooperative jigsaw is carried out through the evaluation of student learning at each meeting. In cycle II, in accordance with pleaning, 2 meetings were held where the recapitulation of the evaluation results in the form of the average and percentage of student achievement, is shown in the following table.

Table 7. Data on the results of achieving product goals on evaluation activities for the composition of human and animal respiratory organs in cycle II.

No	Indicators	Classical Learning Outcomes			Total Completeness	
		Total Value	Average	Percentage	Complete	Not Complete
1.	Me mentions the name of the respiratory organs in humans					
2.	Name the respiratory organs in animals					
3	Distinguish between human and animal respiratory organs					
4	Describe breathing events.	2199.5	**78.6**	78.6	23 students	5 students
	Percentage of classical completeness				**82.14%**	17.86%

The success rate of students in the second cycle are illustrated in Table 7, it appears that the classical percentage of completeness has reached 82.14% with an average of 7 8.6. This has achieved the specified performance indicators, namely the percentage of classical completeness of 80% with an average of 75.

2) Reflection Results in Cycle II

a). Advantages

Excess found during the execution of the act of learning p no second cycle is as follows:

1). Student activity during the teaching and learning process is getting better than the previous meeting.
2). Students become more creative, this can be seen from the way they do group assignments, namely trying to complete tasks effectively.
3). Students become more communicative.
4). Students compete to get the best score
5). The concentration of students while studying is good
6). Students already understand the learning scenario that is applied.
7). Student learning outcomes have increased when compared to the first cycle and performance indicators have been achieved.
8). All action improvement plans based on the reflection results of cycle I have been implemented well in cycle II
9). Teacher performance in learning management has been good
10). Time control has been good.

b). Weaknesses of Cycle II and Follow Up Plan

Weaknesses and follow-up plan in cycle II can be described in the following table:

Table 8. Implementation of Cycle II Learning Action

Weaknesses at the Meeting 1	Corrective Actions and Weaknesses at Meeting 2	Advanced Action Plan
The awarding of prizes to superior students and the best group based on the assessment of learning outcomes in the first cycle has not been implemented	Prizes are given to the student who has the highest score (a pen) and to the best performing group.	Needs to be revisited alignment with indicators of learning materials and learning objectives that can me n to achieve a better target in the development of learning materials.
The number of problems given compared to the processing time has not been balanced.	The problems given are adjusted to the available time allocation.	

c. Student Responses to Learning Actions

At the end of the second cycle, the researcher gave a questionnaire to the students to find out the students' response to the learning that the researcher applied. The results of the student responses can be seen in the following table.

Table 9. Recapitulation of Average and Percentage of Student Responses to Learning Actions.

No Questionnaire	Measured Criteria	Answer Options							
		Strongly agree		Agree		Disagree		Strongly Disagree	
		Average	%	Average	%	Average	%	Average	%
A.	Fun Learning	19	33.39	34	60.71	3	53.8	0	0
B.	Understanding of Subject Materials	22	78.57	5	17.86	1	3.57	0	0
C.	Motivation to learn	23	41.07	33	58.93	0	0	0	0
D.	Improve Thinking Ability	27	36.99	34	46.58	12	2 , 49	0	0
E.	Expressing Opinion	29	51.79	27	48.21	0	0	0	0
Classic	**amount**	**121**		**143**		**2**		**0**	
	Percentage		**43.21**		**51.07**		**5.71**		**0**

Table 9, student responses y ang given to the act of learning cooperative jigsaw seen that in the classical stating the answer to the fifth aspect of the criteria measured, strongly agree reached 43.21%, 51.07% agree, disagree 5.71% and who strongly disagree 0%.

B. Discussion

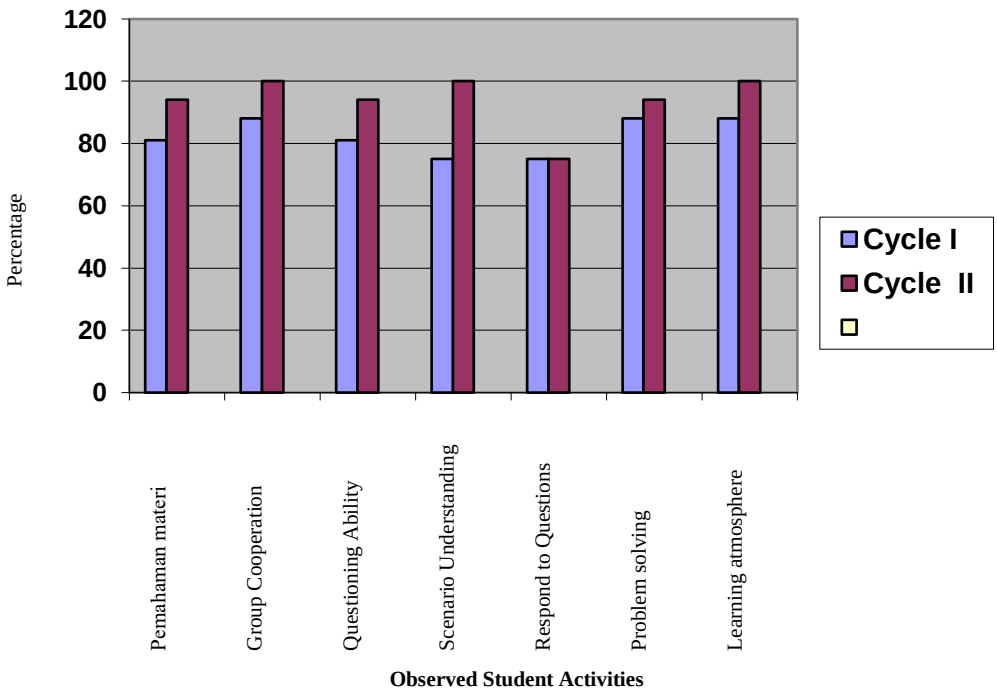
1. Teaching and Learning Process Activities

The teaching and learning process activities observed in supporting the successful application of the jigsaw type of cooperative learning technique that have been determined in pleaning by the researcher include the ability to complete group assignments to support the learning process, student activities in making learning effective and teacher activities in learning. The learning produces a learning activity. For students, learning activities mean using cognitive, affective, and psychomotor abilities to digest teaching materials. In general, the learning activities include the following phases: (1) motivation, which means that students are aware of achieving goals and acting to achieve learning goals, (2) concentration, which means students focus on teaching materials, (3) processing messages, which means students processing information and taking meaning about what is being learned, (4) storing, meaning that students store in their memories, feelings, and motor skills, (5) exploring, in the sense of using things learned which will be used for solutions, (6) achievement, in the sense of using teaching materials for performance, and (7) feedback, in the sense that students justify their learning outcomes or achievements. In terms of objectives, in this study, it was found that there was a priority in teaching content and the acquisition process. In terms of the domains developed include the cognitive, affective, and psychomotor domains.

2. Student Activities in Making Learning Effective

Comparison of student activities in making jigsaw cooperative learning techniques effective from cycle I and cycle II can be seen in the following graph:

Graph 1. Student Activities in Making Learning Effective



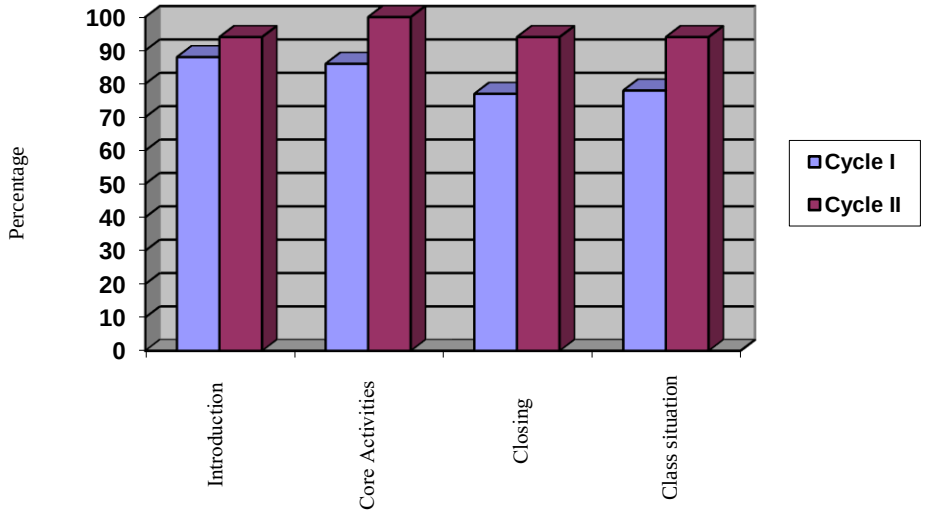
Based on the table, it can be seen that there is an increase in student activities towards a better way to streamline the ongoing learning. This is very important because the role of students in carrying out learning scenarios is one of the main things in achieving the successful application of jigsaw cooperative learning.

The role of teachers in learning activities is relatively high related to the role of students in learning. According to Briggs and Telfer (in Mudjiono; 1999) among students' learning motivation there are those that can be strengthened by learning methods. Instrumental motivation, social motivation, and low achievement motivation, for example, can be conditionally conditioned so that student learning takes place. The ways of learning that affect the learning process can be determined by the teacher.

In the classroom, we find many students who are sleepy or chatting with their seatmates or a group if they are not happy with the teacher's teaching style. In this study, students significantly always showed their activeness in activating learning including the ability to work in groups, and asking various questions. The emergence of this activity is because subject teachers always foster motivation in students. This motivation is grown through the views of Sutikno (2005; 49). These are: (1) grow motivation at the beginning of learning. This can be done by asking homework or providing knowledge prerequisites, (2) at the time of opening the lesson, try to repeat last week's lesson by giving some questions to students, (3) when delivering the subject matter try to tuck in humor and or stories funny, (4) display funny caricature images, (5) try to use learning models that can create good interactions between educators and students and between students and other students, (6) give enthusiasm and *applause* to students after each activity

Besides student activities also made observations of teachers in the learning effectiveness of cooperative jigsaw as driving lessons. Based on the analysis of s data that has been done previously seen that the researcher is always trying to make improvements so that the reflection performance through results from the first cycle to cycle II increased in both the preliminary activities, core activities and activities of the cover and the classroom atmosphere arising from learning actions undertaken. An overview of improving teacher performance from each learning stage can be seen in the following graph.

Graph 2. Teacher Activities in Making Learning Effective

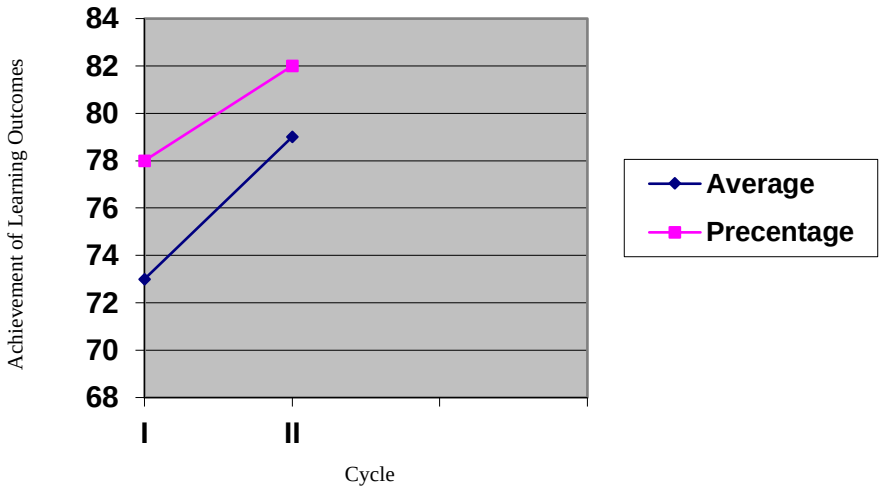


The increase that occurred as shown in the graph above, is the result of the implementation of the actions from the reflection carried out so that the weaknesses detected at each meeting are attempted to be implemented in the second cycle.

3. Student learning outcomes

Measurement of the level of student learning success is carried out through a learning evaluation at the end of each meeting to get the learning outcomes of basic competencies taught, then data processing is carried out by finding the average acquisition of each student. For each activity cycle, it is analyzed by descriptive method through analysis of learning outcomes in order to determine the number of students' scores, as well as the average and classical completeness percentage. The results of achieving learning outcomes in general from Cycle I and Cycle II can be seen in the following graph.

Graphics 3 . Student Results Class V on Application Jigsaw cooperative learning



The average classical in the first cycle reaches the percentage of classical completeness 73.23 and 77.93, while on the second cycle increased where the average classical has reached 78.57 and the percentage of completeness in classical has reached 82.14. Based on this, the performance indicators in this study have been achieved where it has been previously determined that the success rate according to the performance indicators is an average classically reaching 75 and the percentage of success classically is 80%.

The success achieved is not the carrying capacity of one activity factor but the continuation of several factors such as the ability to complete group assignments, student activities, teacher activities, learning facilities and infrastructure as well as collaboration between researchers and collaboration partners that is going well. This success is also the advancement of science and technology which has implications for the expansion of human horizons in various fields of knowledge so that each successive generation must learn more to become educated human beings in accordance with the times.

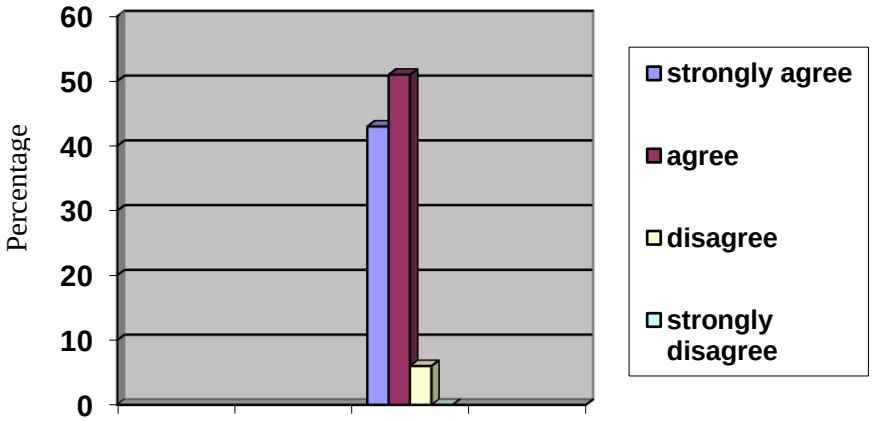
Based on the results obtained and all the obstacles and obstacles experienced by the researchers, the results of the applied reflections, problem solving discussions and all existing situations, it can be concluded that the application of the jigsaw type cooperative learning technique has been able to improve the learning outcomes of fifth grade students at SDN 100 Kendari in Science subjects Materials The composition of the respiratory organs of humans and animals.

Researchers admit that the achievement of performance indicators is expected to have achieved but there are still some students who have not completed, but is based on the analysis of items in the classical has reached over 65%, so that generally indicates that the question has been able to excel at large students.

4. Student Response to Learning

The willingness and ability of students to understand and participate in demonstrating the jigsaw cooperative learning model can be seen from individual students, therefore at the end of the second cycle the researcher gave a questionnaire to students to determine student responses to the applied learning. In general, the results of these student responses can be seen in the following graph.

Graph 4 . Student Responses to Jigsaw Cooperative Learning



From the graph, it appears that most students agree on the application of jigsaw cooperative learning. By using a Likert scale (adapted from Ninik Kristen, 2007) where in this study students stated strongly agree by 43.21%, agree 51.07%, and 5.71 disagree. In a further meeting before the implementation of learning researchers conveyed feedback on some students who respond do not agree, and based on the results of the analysis of questionnaire data showed that the answer comes as caused by some students feel is consumed time daily in completing the task load given by the teacher through the group leader, there is a lack of willingness to understand the content of the tasks given, feel that learning that is bound by accuracy, speed and seriousness in the learning process seems heavy, and some students who are less able to argue and have courage in presentations feel awkward.

The increase in student responses to the jigsaw cooperative learning model was caused by the seriousness of students in participating in learning. This sincerity is also supported by relevant learning models, so that students are very enthusiastic in participating in learning on science materials

In jigsaw cooperative learning there will be social interaction that can build students' cognitive because learning occurs in groups, discussing and exchanging ideas so that it is easier for students to understand the concepts being taught.

The description above is supported by the teacher's observations and several collaborators said that with the jigsaw cooperative learning model at SDN 100 Kendari it was easier for students to understand the concept of science, because students studied together with the teacher, drawing conclusions after conducting group discussions with jigsaw cooperatives. From the results of the analysis carried out, it was found that the application of the jigsaw cooperative learning model described an increase in student learning outcomes.

The selection of teaching models according to Sutikno (2005; 56) is an effort by educators to adjust various goals. There is no single teaching model that can cover all goals. There are many types of learning models, but not all models are suitable for all materials. A good learning model is if the model can be used to achieve the desired learning objectives. Furthermore, educators should strive to use varied learning models in order to reduce boredom. Life will be more interesting if it is lived with variety. Variations in learning activities are changes in the process of activities that aim to increase the motivation of students and reduce boredom and boredom. The selection of teaching models is an attempt by researchers in adjusting various objectives. There is no single teaching model that can cover all goals. There are many types of learning models, but not all models are suitable for every material. A good learning model is if the model can be used to achieve the desired learning objectives, especially students. This concurs with the results of the students processed Against r es pounds in Learning Cooperative Jigsaw mode.

V. CONCLUSIONS AND SUGGESTIONS

A. Conclusion

During research activities until data processing is carried out, it can be concluded that:

1. The results of research on the learning process using cooperative jigsaw types have advantages, namely that in the learning process on the composition of human and animal respiratory organs , students have seriousness in participating in learning, so they are very enthusiastic in participating in learning, this type of jigsaw cooperative allows students to interact social skills that can build students' cognitive because learning occurs when students work to handle the tasks given, students work together in groups, discuss and exchange ideas making it easier for students to understand the concepts being taught.
2. The application of the jigsaw type cooperative learning model can improve the learning outcomes of fifth grade students at SDN 100 Kendari on the subject of human and animal respiratory organ structure . The achievement of performance indicators has been achieved where the classical average in the first cycle reached 73.23 and the percentage of classical completeness was 78.57 while in the second cycle there was an increase where the classical average had reached 78.6 and the percentage of classical completeness had reached 82.14. Based on this, the performance indicators in this study are the classical average of 75 and the classical percentage of success is 80%.

B. Suggestion

Referring to the conclusion above, the researcher tries to give suggestions as follows:

1. For science teachers, the application of learning models that emphasize more on student activities needs to be continuously developed. This is very important because the formation of knowledge is carried out actively by students
2. Based on the results of the study, that the application of the jigsaw learning model is quite effective as a learning strategy, it needs to be applied in science learning or for other study materials.
3. The researcher is fully aware that the implementation of the application of this study is not yet fully optimized so that next researcher the study and examine issues regarding the development of the learning model jigsaw, more broadly, so that the application of this model becomes more perfect and more popularized it in the world of education, especially in elementary school level.

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