

The Implementation of Reciprocal Teaching Learning Strategies in Improving Students' Questioning and Cognitive Ability on the Concept of Human Digestive System in Junior High Schools

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Abstract

This study aims to apply reciprocal learning strategies to improve students' questioning and cognitive abilities on the concept of the human digestive system. Classroom action research. The subjects of this study were 25 students. The research instruments consisted of tests, teacher observation sheets, student observation sheets, and assessment sheets for questioning abilities and cognitive abilities. The results of the data analysis showed that there was an increase in the ability to ask questions and students' cognitive abilities from cycle I to cycle II which affected the increase in achievement indicators of learning outcomes. Cognitive abilities of class VIII B students. From an average of 66 in the first cycle, it increased to an average of 88 in the second cycle and reached a minimum KKM of 70. The activities of teachers and students increased from cycle I to cycle II. It can be concluded that the application of the reciprocal teaching-learning strategy can improve the ability to ask questions and the cognitive abilities of Class VIII B students of SMP Negeri 7 Palu.

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Introduction

The learning that has been carried out so far is still shrouded in the view that knowledge is a set of facts that must be memorized. Still focused on teachers as the main source of knowledge, then lectures became the main choice of learning strategies. As a result, the learning process which requires students as active learning actors has not been able to run optimally.

Based on the results of preliminary observations at school, biology lessons have tended to only hone aspects, considering that many students only memorize concepts, note what the teacher says, are passive, and rarely use initial knowledge as the basis for lesson planning.

Teachers' understanding, understanding, and views of the learning model will also affect the role and activities of students in learning. It is better if teacher activities in teaching and student activities in learning are highly dependent on teachers' understanding of learning models. Teaching is not just a process of delivering knowledge but contains a broader and more complex meaning, namely the occurrence of communication and interaction between students and teachers.

The learning process applies learning models that attract students to participate actively in teaching and learning activities. Basically, active learning is learning that invites students to be more active during the learning process. Students are required as subjects in learning. One of the learning models that can be modeled during the learning

process is reciprocal teaching. Reciprocal teaching is a learning model that has benefits so that learning objectives are achieved through independent learning activities and students are able to explain their findings to other parties.

Reciprocal teaching (reverse teaching) is a teaching procedure to develop cognitive abilities. In addition to cognitive abilities, there are two other cognitive activities that are very important in relation to daily cognitive skills, namely decision-making and creative thinking, so they can be used as an alternative learning method that is considered attractive and is expected to encourage and improve students to creative thinking in science learning. It can also be said that reverse learning is a learning process to teach students four strategies of understanding and self-regulation, namely compiling material, making questions, explaining learning material, and predicting the development of the material being studied. Previous research on reciprocal teaching Novianti (2017) his research focuses on metacognition and affective and Widya et al. (2017) his research, focus on metacognitive skills.

Hanifa et. al (2014) explained that asking questions can train students to think because asking questions is part of thinking. Active student involvement in the learning process can be shown from the questioning activities proposed by students. Questioning skills are dominant and strategic skills because of the interaction of teachers and students in the learning process and enable students to participate in learning.

Effective questioning by the teacher directs students to understand the content of the lesson, increases curiosity, stimulates imagination, motivates students to acquire new knowledge, directs student attention, keeps students involved in the learning process, provides space for students to express themselves, and improves student participation (Ralph, 1999, Husen, 2013).

The teacher's questioning technique will also affect student participation in the learning process. Questions can be classified based on their form and content or content. Questions based on their shape can be divided into two, namely convergent and divergent questions (Mariati, 2006). Meanwhile, questions based on content are divided based on Bloom's taxonomy (Ragawanti, 2009).

Hamalik (2009) states that a good question is a high-level cognitive question because it can increase students' thinking levels. The same thing was stated by Shen & Yodkhumle (2006) who stated that to improve students' critical thinking skills, the types of questions that must be asked in the learning process are high-level cognitive questions. Apart from the types of questions, the technique of asking the teacher in asking questions is an important aspect to note. The purpose of using effective questioning techniques is to increase student participation in the learning process. There are several questioning techniques that the teacher needs to pay attention to in asking questions, for example, the use of clear questions, giving waiting time, distributing questions,

Kemendikbud (2014) explains how important it is to train students to ask questions because training students to ask questions will form students who have critical thinking; besides that, it also motivates students to learn independently and helps students to find ideas and understandings in science. Questions can be classified based on certain considerations. The question term is not always in the form of an interrogative sentence but can also be in the form of a statement, provided both of them want a verbal response.

Field observations made while teaching staff, especially in class VIIIB students of SMP Negeri 7 Palu, found that students' cognitive abilities and questioning abilities were only limited to the C1 and C2 domains, especially ecosystem material, the value of daily test results and student semester tests was less than half reaching the completeness criteria minimum for science subjects. The completeness criteria minimum is set at 75 and students who are said to have completed 45%. Students' ability to understand ecosystem material varies from year to year with the same learning tools and learning models. Based on the variation in these values, is caused by the students and the different abilities of the students and the less varied teaching methods of the teacher. This fact shows that this variation is caused by several factors originating from students such as different student abilities and less varied teacher teaching methods with other models that

might improve students' cognitive abilities and questioning abilities so that student interest and learning outcomes can be further improved.

The problems that cause the low ability to ask questions and the cognitive abilities of students are the teacher's inaccuracy in choosing learning strategies, namely the methods used in the learning process to achieve predetermined learning objectives. This problem arises due to the application of methods and learning models that are not quite right. The ability to ask questions should be owned by every student, if students already have the ability to ask questions and cognitive abilities, students will find it easier to solve a problem that is in front of them. By usually solving or solving a problem, students will get used to facing any problem that is as difficult as it is. For this reason, the most important task of the teacher in this education is to develop the abilities possessed by students,

Class VIIIB students of SMP Negeri 7 Palu are still less active in asking questions because they still tend to have students only accept material without any feedback between students and teachers in asking and giving questions directly. In addition, the cognitive abilities of class VIIIB students of SMP 7 Palu were only limited to C1 memory and C2 understanding from the results of direct observation of class VIIIB students of SMP Negeri 7 Palu for 2 academic years.

Based on these problems, the skills in choosing a learning model owned by the teacher are expected to be able to foster the ability to ask questions and cognitive students of class VIIIB at SMP Negeri 7 Palu, especially in science learning. Therefore, it is necessary to do research with the title, "The Implementation of reciprocal teaching learning strategies in improving students' questioning and cognitive abilities on the concept of the human digestive system in class VIIIB SMP Negeri 7 Palu.

Materials and Method

This research will be carried out with reference to the model Thursday and Taggart. The implementation is planned for a maximum of 2 cycles. Arikunto (2009) explains that the CAR stages consist of planning, action, observation, and reflection.

Research Stages

Cycle 1

Action planning I

Planning for the implementation of the action must be prepared in full with several activities carried out in the research so that it can run smoothly and changes due to actions can be recorded properly. The activities that will be carried out in this research are as follows:

- 1) Designing a learning implementation program that is consistent with the method or model to be carried out (Lesson Plan).
- 2) Arrange student activity observation sheets.

- 3) Designing and preparing the media or learning tools to be used.
- 4) Develop instruments for evaluation and instrument testing.

Implementation of actions I

The implementation of this stage of the strategy design and learning application scenarios will be applied. The activities carried out are implementing the RPP that has been prepared.

Observation/Data collection I

Observation of this stage is related to the implementation of class actions. This activity uses an observation sheet that includes: student activities, teacher activities, and the ability to ask questions.

Reflection I

This reflection stage thoroughly examines the actions that have been taken in each cycle, based on the data that has been collected, and then conducts an evaluation in order to perfect the next action. Activities carried out are analysis and assessment of the results of observations of actions that have been taken. The results of reflection are used as a basis for improvement in planning the next cycle.

Cycle 2

Action planning II

Planning for the implementation of the action can run smoothly and changes due to the action can be recorded properly, so this **planning** must be prepared completely. Some of the activities carried out in this study are as follows:

- 1) Designing a learning implementation program that is consistent with the method or model to be carried out (Lesson Plan).
- 2) Prepare observation sheets for student activities, teacher activities, and the ability to ask questions.
- 3) Designing and preparing the media or learning tools to be used.
- 4) Develop evaluation instruments and instrument tests.

Implementation of actions II

The implementation of the strategy design stages and the implementation of learning scenarios will be applied. The activities carried out are implementing the Lesson Plan that has been prepared.

Observation/Data collection II

Observation of this stage is related to the implementation of class actions. This activity uses an observation sheet that includes: student activities, teacher activities and the ability to ask questions.

Reflection II

This reflection stage thoroughly examines the actions that have been taken in each cycle, based on the data that has been collected, and then conducts an evaluation in order to perfect the next action. Activities carried out are analysis and assessment of the results of observations on actions that have been taken to determine the increase

Results and Discussion

This research uses Classroom Action Research. The researcher acted directly in the research, from the beginning to the end of the action which was carried out from July to August including the process of drafting and validating the instrument, then continued with the process of collecting data using an online system for students of SMP Negeri 7 Palu. Observation of subjects in the implementation of research This is a class VIIIB student of SMP Negeri 7 Palu and registered in the 2019/2020 Academic Year, number 25 students.

Before the classroom action research was carried out, the researcher gave a test instrument test. Test instrument tests are conducted before teaching activities are given. The benefits of holding a test instrument trial test are to determine students' initial abilities regarding the lessons delivered. In essence, it is a series of questions or tasks that must be answered or done by students, the results of which are used to measure the ability of students, are the results of the evaluation in the form of tests and tests that provide quantitative data.

The purpose of the test in learning is to provide accurate information about the level of achievement in the learning process and whether or not the test instrument is used in classroom action research so that decisions can be made by researchers about what to do with students in classroom action research based on the recapitulation of results. Test instrument trial. A recapitulation of the test results of the test instrument can be seen in Table 1.

Table 1. Scores and categories of the finding respondent test

No. Question	Validity		Discernment		Level of Difficulty		Decision
	Rxy	Interpretation	D	Interpretation	p	Interpretation	
1	0.601	Enough	0.40	Good	0.65	Moderate	Used
2	0.489	Enough	0.30	Enough	0.75	Easy	Used
3	0.58	Enough	0.30	Enough	0.75	Easy	Used
4	0.646	High	0.60	Good	0.80	Easy	Used
5	0.654	High	0.40	Good	0.45	Moderate	Used
6	0.818	Very high	0.50	Good	0.75	Easy	Used
7	0.442	Enough	0.40	Good	0.45	Moderate	Used
8	0.677	High	0.20	Enough	0.70	Moderate	Used
9	0.555	Enough	0.40	Good	0.70	Moderate	Used
10	0.583	Enough	0.20	Enough	0.80	Easy	Used
Reliability				0.850		R table = 0.44	
Criteria				Very high		Df = 20-2 = 18 at 5%	

Based on Table 1, the test results show that the difficulty level of the 10 questions tested for the easy category is 50% or as many as 5 items, and the medium category is 50% or as many as 5 items. The distinguishing power of 10 items in the good category was 60% or consisted of 6 items, while the moderate category was 40% or consisted of 4 items. For the validity results, the questions in the very high category were 10% or consisted of just 1 question, the high category was 30% or consisted of 3 questions, while those in the moderate category were 60% or consisted of 6 questions. The results of the test reliability of all questions were declared reliable in the very high category, namely 0.850.

Data description

Data descriptions are presented to provide an overview of the distribution of data from the study. The data description describes data that is useful for obtaining a tangible form from the respondent so that it is easier for researchers or other people to understand who is interested in the results of the research to understand it understands. The function of the data description is to administer and display the existing summary to make it easier for other readers to understand the meaning of the data display. The data presented is in the form of raw data obtained from the treatment cycle I and II. The data processed in the study consisted of the student's cognitive ability variables, the student's questioning ability variable, and the results of the observation of teacher and student activity assessments.

Cycle I research results

The implementation of Cycle I was held three times according to the lesson schedule.

Meetings are held through an online system but still use the reciprocal teaching-learning strategy. The researcher prepared an online learning preparation plan that would be implemented using the reciprocal teaching-learning strategy on the human digestive system.

The results of the observations show that the learning activities have been carried out in accordance with the Learning Implementation Plan which is adjusted to the reciprocal teaching-learning strategy. At the end of the lesson, an evaluation was held to determine the increase in questioning skills and cognitive abilities of class VIIIB students on the food digestion system in humans. The function of cognitive abilities is a conscious mental activity such as thinking, remembering, learning, and using language. Cognitive abilities are also the abilities of attention, memory, consideration, problem-solving, and executive abilities such as planning, assessing, monitoring, and evaluating at the end of learning.

The ability to ask students varies in one class, this can be seen during the online system of teaching and learning and the quality of the questions expressed by students is different. Students' skills in asking questions are needed by students in carrying out the learning process so that it will have an impact on the depth of the material received as well as increase student learning achievement.

Results of observation of teacher and student activities in cycle i

a) Teacher activity

To find out the teacher's activities in the learning process, observations were made that were directly observed by peers as collaboration in this study.

Based on data from observers' observations, the teacher's activities in teaching and learning activities are very decisive in the learning process. The results of observations of teacher activities at the first meeting of a cycle I with a percentage of 42.8% were classified as sufficient criteria. At the second meeting of the first cycle, began to show an increase with the acquisition of a score of 64% which was classified as good criteria, at the third meeting of the first cycle the teacher's activity increased again to 75.7% classified as good criteria.

b) Student activities

In addition to teaching activities, observers also observe student activities in learning. Based on data from observer observations, student activities in teaching and learning activities at the first cycle of meetings with a percentage of 41.5% were classified as sufficient criteria. At the second meeting of the first cycle, began to show an increase with the acquisition of a score of 60% which was classified as good criteria, and at the third meeting of the first cycle, student activity increased even more to 66.1% classified as good criteria.

Reflection of action cycle I

The implementation of the first cycle of actions in this study was conducted 3 times. The first meeting was on Monday, 3 August 2020, the second meeting was Tuesday 4 August 2020 and the third meeting was on Wednesday, 5 August 2020, the online system in class VIII B SMP Negeri 7 Palu through the application of the reciprocal teaching-learning model. In cycle I there are several drawbacks;

- 1) Students are not active in the learning process.
- 2) During the discussion, the teacher did not explain in detail the syntax of the reciprocal teaching-learning model, so students seemed less enthusiastic about doing worksheets.
- 3) Students still feel embarrassed about making presentations, so the discussion does not run optimally.
- 4) Teachers do not provide reinforcement and appreciation to students who ask questions and provide explanations for questions.
- 5) Students find it difficult to make their own questions according to the existing material.
- 6) Students have not provided an explanation for the questions asked by other discussion group friends.

The causes of weaknesses in cycle I are:

- 1) Students' learning habits are only listeners.

- 2) Teachers often do learning by lecturing and giving independent assignments.
- 3) Students find it difficult to communicate alone in front of their friends via online.
- 4) Students are always silent when presenting the results of the discussion.
- 5) Students are used to writing questions given by the teacher.
- 6) Students do not understand the main content of the question.

How to overcome the weaknesses in cycle are:

- 1) Teachers must always motivate students to actively learn.
- 2) The teacher provides information about the worksheet procedure according to the syntax of the reciprocal teaching-learning model.
- 3) Guiding students in discussions on ways to make a maximum percentage of the results of the discussion.
- 4) The teacher must provide reinforcement and appreciation to students who ask questions and students who answer questions so that students are more active in participating in group discussions.
- 5) Motivating students to express ideas in making questions.
- 6) Guiding students to answer questions asked by their friends.

Paying attention to what the teacher has done in learning during the implementation of cycle I, basically the teacher is doing his job well, but not perfect in using the reciprocal teaching-learning model so that it has not affected cognitive abilities and questioning abilities.

The cognitive abilities of students in cycle 1 after being given reciprocal teaching-learning strategy treatment obtained the lowest score of 48, the highest score of 92, and the average value obtained was 66.24. With the percentage of students' ability to ask, it was obtained that C1 = 72%, C2 = 60%, C3 = 56%, C4 = 56%, C5 = 44%, C6 = 12%. The percentage of students' cognitive ability to ask questions was very good, but the average score of the results of the cognitive ability instrument test results and the students' ability to ask questions using reciprocal teaching learning strategies was still below the completeness criteria minimum score of 70, so the researcher continued the research in cycle II.

Research data cycle II

The implementation of Cycle II was held three times according to the lesson schedule.

Meetings are held through an online system but still use the reciprocal teaching-learning strategy. Researchers prepare an online learning preparation plan that will be implemented using the reciprocal teaching-learning strategy on human digestive system material.

Observation of the implementation of this second cycle the researcher used reciprocal teaching learning strategies to improve the results of questioning skills and cognitive abilities. The student's ability to ask the action in cycle II was improved compared to the first cycle using reciprocal teaching learning strategies on the material of the digestive system in humans. Asking questions will enable students to build and interpret any information and knowledge they get.

Results of Observation of Teacher and Student Activities in Cycle II.

a) Teacher activity

Likewise in cycle I, in cycle II, observations were also carried out to determine teacher activities in the learning process. Based on data from observers' observations, the teacher's activities in teaching and learning activities are very decisive in the learning process. The results of the observation of teacher activity at the first meeting of cycle II with a percentage of 75.7% were classified as good criteria. At the second meeting of cycle II, it began to show an increase with the acquisition of a score of 91% which was classified as very good criteria, and at the third meeting of the second cycle the teacher activity increased even more to 94.7% classified as very good criteria.

b) Student activities

In addition to teaching activities, observers also observe student activities in learning. Based on data from observer observations, student activities in teaching and learning activities at the first cycle of meeting II with a percentage of 66.1% were classified as good criteria. At the second meeting of the second cycle, it began to show an increase with the acquisition of a score of 89.2% which was classified as very good criteria, and at the third meeting of the second cycle, student activity increased even more to 93.3% classified as very good criteria.

Reflection on action cycle II

After reviewing, studying, and discussing the results of observations together with colleagues, it can be identified that the excess activities in cycle II are as follows:

1) Implementation of learning activities can be carried out in accordance with the action plan that has been designed.

2) There is seriousness among students in following the learning process and doing the assignments given.

3) Increased activeness in learning activities.

4) The increased ability of students in assessing the application of the reciprocal teaching-learning model which in the end can have a positive impact on the increase in cognitive abilities and the ability to ask students in cycle II.

5) Students' understanding of the digestive system material in humans shows gradual progress. This is evident in the student's scores each cycle increased.

6) Learning in cycle II is considered complete and successful because the ability to ask questions and the cognitive abilities of students have reached predetermined completeness.

The results of students' cognitive abilities in cycle II after being given reciprocal teaching-learning strategy treatment, the lowest score was 72, the highest score was 100 and the average score was 80 with the percentage of students' cognitive ability to ask, it was obtained C1 = 76%, C2 = 64%, C3 = 68%, C4 = 68%, C5 = 60%, C6 = 48%. The percentage of the student's cognitive ability to ask questions was very good and the results of the student's cognitive ability instrument test using the reciprocal teaching-learning strategy had reached the completeness criteria minimum score of 70, so the researcher took action to stop the implementation of classroom action research as limited as cycle II.

Students' cognitive abilities

Cognitive ability thought process, it is the individual's ability to connect, assess, and consider an event or event, cognitive function is also the ability of attention, memory, consideration, problem-solving, and executive abilities such as planning, assessing, monitoring, and evaluating. The way to improve cognitive abilities is to condition the class by providing motivation and advice, using appropriate methods and strategies. Based on the results of students' cognitive abilities in class VIII B SMP Negeri 7 Palu after being given reciprocal teaching-learning strategy treatment in cycle I and cycle II there was an increase. The increase in students' cognitive abilities in cycle I and cycle II can be seen in Table 2.

Table 2. Cognitive ability cycle I and cycle II

No.	Cognitive Ability	Cycle I	Cycle II
1.	The number of students	25	25
2.	Lowest score	48	72
3.	The highest score	92	100
4.	Average	66	80

Cognitive abilities are the basis for a child's ability to think. So the cognitive process is related to the level of intelligence (intelligence) which marks a person with various interests, especially aimed at learning ideas. Cognitive abilities are thought process construction, including remembering, problem-solving, and decision-making, from childhood to adolescence to adulthood.

The results of the cognitive abilities of students in cycle I had the lowest score of 48 and the highest score of 92, while in the second cycle the results of cognitive abilities were the lowest score of 72 and the highest score of 100, with the average of the first cycle of 66 had not reached the completeness criteria minimum score of 70 so that the researcher continued the second cycle by obtaining the average value in cycle II was 80. From these results, after being given reciprocal teaching-learning strategy treatment, there was an increase in the cognitive abilities of class VIII B students.

The students questioning ability

Asking ability way of delivering a lesson through two-way interaction, namely from teacher to student and from student to teacher in order to obtain material certainty answers through teacher or student oral answers. Asking is a verbal statement that asks for a response from someone they recognize. The response given can be in the form of knowledge of things that are the result of consideration to encourage thinking skills, thinking ability can process previously acquired information to solve new, different problems.

Based on the results of the student's ability to ask questions in class VIII B SMP Negeri 7 Palu after being given reciprocal teaching-learning strategy treatment in cycle I and cycle II there was an increase. The increase in students' ability to ask questions in cycle I and cycle II can be seen in Table 3.

The results of the students' ability to ask questions in the first cycle with a percentage of C1 72%, C2 60%, C3 56%, C4 56%, C5 44% and C6 12%. In the second cycle, the percentage increased,

namely C1 76%, C2 64%, C3 68% C4 68%, C5 60%, and C6 48%. Cholidah et al. (2013) explained that there are two forms of questioning, namely high-level question and low-level questions. From these results, after being given reciprocal teaching-learning strategy treatment, there was an increase in the students' questioning ability of class VIII B.

Assessment of teacher activity observations in cycle I and cycle II

Table 3. The questioning ability cycle I and cycle II

No	Stages	Percentage of Questioning ability					
		C1	C2	C3	C4	C5	C6
1	Cycle I	72 %	60 %	56 %	56 %	44 %	12 %
2	Cycle II	76 %	64 %	68 %	68 %	60 %	48 %

Teacher activities are activities carried out by the teacher during the learning process, the teacher has a duty to provide knowledge (cognitive), attitude and value (affective), and skills (psychomotor) to students. The teacher has the responsibility to see everything that happens in the classroom to help the process of student development. The delivery of subject matter is one of the various teacher activities in learning as a dynamic process in all phases and student development in the learning process (Dimiyati, 2010).

Based on the results of the percentage of observations of teacher activity in class VIII B SMP Negeri 7 Palu after being given reciprocal teaching-learning strategy treatment in cycle I and cycle II there was an increase. Improved results of the Observation Assessment of Teacher Activities in Cycle I and Cycle II can be seen in Table 4.

Table 4. Results of observations of teacher activities in Cycle I and Cycle II

No	Stages	Observation of Teacher Activities		
		Meeting I	Meeting II	Meeting III
1	Cycle I	42.8%	64%	75.7%
2	Cycle II	75.7%	91%	94.7%

Teacher activities are activities that are carried out by the teacher during learning. Learning activities that the teacher needs to pay attention to in order to create an effective learning atmosphere.

The results of observations of student activities in cycle I and cycle II

Activity students during the learning process is an indicator of the desire of students to learn. Activities in the teaching and learning process are a

series of activities that include student activeness in following lessons, asking questions that are not yet clear, taking notes, listening, thinking, reading and all activities undertaken that can support learning achievement. There was an increase in the observation of student activity observation in cycle I and cycle II. The increase in the results of student activity observation of reciprocal teaching learning strategies in cycle I and cycle II can be seen in Table 5.

Table 5. The results of observations of student activities in Cycle I and Cycle II

No.	Stages	Observation of Student Activities		
		Pert. I	Pert. II	Pert. III
1	Cycle I	41.5%	60%	66.1%
2	Cycle II	66.1%	89.2%	93.3%

Student activeness in learning has various forms, from physical activities that are easily observed to psychological activities that are difficult to observe. Physical activities that can be observed include activities in the form of reading, listening, and writing, displaying, and measuring. Whereas examples of psychological activities include recalling the content of subject matter at previous meetings, using the knowledge possessed to solve problems, concluding experimental results, and comparing one concept with another (Dimiyati, 2010).

Cognitive ability

The cognitive abilities obtained show that students at SMP Negeri 7 Palu, especially in class VIII B, have sufficiently good cognitive abilities but must be more trained in the application of learning strategies and learning models that require students to be active and in research conducted by researchers choose reciprocal learning strategies teaching. The results of the cognitive abilities of students in cycle I had the lowest score of 48 and the highest score of 92, while in the second cycle, the results of cognitive abilities were the lowest score of 72 and the highest score of 100, with the average of the first cycle of 66 had not reached the completeness criteria minimum score of 70 so that the researcher continued the second cycle by obtaining the average value of the second cycle is 80, the increase in the value of cognitive abilities from cycle I to cycle II is caused by:

- 1) The activities of students and teachers are getting better in the learning process in the reciprocal teaching-learning strategy, the higher the student's cognitive value. The same thing

was stated by Sardiman (2004) which states that student activeness in the learning process will lead to high interaction between teachers and students or with the students themselves, this will result in a fresh and conducive classroom atmosphere, where each student can involve his / her abilities to the maximum maybe. Activities arising from students will also result in the formation of knowledge which will lead to increased achievement.

- 2) The level of individual intelligence, because the level of individual intelligence in one class is different. This is in accordance with Khusniah & Dede (2017) who state that cognitive abilities are the basis for children's ability to think. so the cognitive process is related to the level of intelligence that marks a person with various interests especially aimed at learning ideas, with the existence of learning ideas and using the reciprocal teaching-learning model can increase students' cognitive value because the teacher is only a facilitator who plays an active role in the students so that, what students get is immediately embedded in their memory

The reciprocal teaching-learning strategy greatly affects the results obtained, because learning using reciprocal teaching-learning strategies students will go through several stages that can arouse the enthusiasm for learning and students' curiosity to find information/knowledge from the activity of finding and obtaining solutions to the problems displayed. This is in accordance with Sardiman (2009) statement that the enthusiasm for learning and curiosity is an encouragement both from within students and from outside which will cause a change in the individual as the experience of the individual himself in interacting with his environment and to achieve goals. which is expected. The enthusiasm for learning has an influence on student learning behavior, namely encouraging increased enthusiasm and persistence in learning. The enthusiasm for learning plays an important role in giving passion, enthusiasm, and pleasure in learning so that students who have high motivation have a lot of energy to carry out learning activities which in the end will be able to get better achievements.

Aritonang (2008) also adds that enthusiasm for learning is a condition that arises in an individual caused by the interaction between motives and events observed by the individual, thus

encouraging the activation of behavior into real action. The enthusiasm for learning is the psychological driving force within a person to be able to carry out learning activities and increase skills and experiences.

Cognitive ability data in this study were measured using cognitive ability tests based on indicators of cognitive abilities. The cognitive abilities obtained showed that the cognitive abilities of students, especially in class VIIIB, were at an average level but were already very good. In the implementation of learning on the application of reciprocal teaching learning strategies with the results of student and teacher observations, students are able to collect the information/knowledge needed to solve a problem and manage the information/knowledge obtained to make solutions to problems that have been raised at the beginning of learning. In addition, students have also been able to transfer the information / knowledge obtained to other students in online discussions. These results are in accordance with the indicators of success in research. This is consistent with the expression [Schermehon et al. \(2007\)](#) that indicators of cognitive abilities are made based on aspects of cognitive abilities, aspects of cognitive abilities influence cognitive development, and cognitive development is influenced by factors of heredity, environmental factors, maturity, formation, interests and talents, freedom and parent-child interaction.

The application of the reciprocal teaching-learning strategy is carried out using an online learning system, but the enthusiasm for learning of class VIIIB students to obtain information/knowledge is very good. The results of the class VIIIB students' cognitive abilities increased significantly after being given the application of reciprocal teaching learning strategies.

Questioning ability

Class VIIIB students of SMP Negeri 7 Palu are still less active in asking questions based on direct observation in the field because students still tend to only receive material without any feedback between students and teachers in asking and giving questions directly, but there are some students asking questions only limited to C1 and C2.

The ability to ask questions based on the results of the study showed an increase in the first cycle of obtaining a percentage of C1 70%, C2 60%, C3 56%, C4 56%, C5 44% and C6 12%. In the second cycle, the percentages of C1 70%, C2

64%, C3 68%, C4 68%, C5 64% and C6 48% were obtained. The increase in the ability to ask questions from cycle I to cycle II is caused by:

- 1) The reciprocal teaching learning strategy is applied because in the reciprocal teaching syntax in the second syntax, namely making and compiling questions (question generating), students are automatically motivated to make questions directed by the teacher and discuss longer, because each group takes turns moving forward presenting questions and answers that are made in groups and respond to each other to questions from several groups so that interaction occurs between groups. Interaction between groups fosters confidence in expressing questions and answers. This is in accordance with [Kemendikbud \(2014\)](#), explaining how important it is to train students to ask questions because training students to ask questions will form students who have critical thinking, there will be interactions between students, besides that, also motivates students to study independently and helps students to find ideas and understandings in science. Questions can be classified based on certain considerations. The question term is not always in the form of an interrogative sentence but, it can also be in the form of a statement, provided both of them want a verbal response. [Farmer \(2014\)](#) explained that the ideal question involves seeking information to cause thinking, [Widodo \(2012\)](#) also explained that questioning skills can improve student achievement, and [Chin \(2001\)](#) question is one of the psychological tools to think and helps students build their knowledge psychologically.
- 2) Teacher and student activities. The interaction between teachers and students greatly affects the ability to ask students because the active teacher always reminds and guides and motivates students to making questions and giving answers to other groups 'questions can improve students' asking ability. This is in accordance with the expression [Hanifa \(2014\)](#) explains that teacher and student interactions in the learning process can activate students to participate in learning and [Prasetyo \(1984\)](#) reveal that science education can increase learning activities in the classroom.

Observation of teacher and student activity assessment

Based on the results of the research that has been carried out, the observation results obtained

from the assessment of student activities in the first cycle obtained the percentage of meetings 1 score of 41.5%, meeting 2 scores of 60%, meeting 3 scores of 66.1%. For meeting 1 teacher the score is 42.8%, for meeting 2 scores 64%, meeting 3 scores 75.7%. In the second cycle of student activity, the percentage of meeting 1 was 66.1%, meeting 2 had a score of 89.2%, and meeting 3 had a score of 93.3%. For meeting 1 teacher activities a score of 75.7%, meeting 2 a score of 91%, and for meeting 3 a score of 94.7%. In the first cycle the teacher and student activities in the good category in the second cycle experienced an increase in the very good category, The activities of teachers and students in the reciprocal teaching strategy greatly affect their cognitive abilities and the ability to ask students, the better the activities of students and teachers in the learning process, the more cognitive abilities and students' ability to ask questions. This corresponds to said Sardiman (2004) that low student activity often causes less understanding and mastery of learning material. If this is allowed to happen continuously, it cannot be denied that it will affect cognitive abilities Bowker (2010) explained that training students can help ask questions that are interrelated, related, and contextual and Hackers & Tenent (2002) longer discussion, more often it can train students to act as teachers.

The learning carried out in the study showed that the student's ability to ask questions on cognitive abilities obtained in C1 data was quite good with a percentage of 73.3%, but for C5 and C6, it was obtained very bad with a percentage of 0%. After being given the application of the reciprocal teaching-learning strategy to the VIII B class students online, the student's motivation to ask questions to the teacher will affect the student's ability to ask questions on their cognitive abilities. C1, C2, C3, C4, C5 and C6 cognitive abilities increased significantly in cycles I and II. The significant increase from cycle I and cycle II in this study is caused by:

- 1) The existence of student seriousness or student learning behavior in following the learning process and doing the assignments given by the teacher
- 2) Teacher behavior in teaching.
- 3) The interaction between teachers and students in the learning process.
- 4) The learning model used by the teacher when teaching. Of the four factors, it affects the

increase in cognitive abilities, if one of the factors does not support the learning process, then the students' cognitive abilities decline. This as stated by Surya (2004) divides four important aspects of the teaching and learning process in the form of (a) students' own learning behavior, (b) teacher teaching behavior, (c) interactions between teachers and students, and (d) learning models. Winkel (1987) also added that the factor that affects learning achievement is cognitive style. Cognitive style is a typical student way of learning, both in terms of receiving and processing information, attitudes towards information, and habits related to the learning environment. Slameto (2003) states that the factors that influence student achievement are physical factors, psychological factors, fatigue factors, family factors, school factors, and community factors. Learning achievement can be achieved by someone after he makes learning changes, both at school and outside of school.

Based on the above results, the application of reciprocal teaching learning strategies can improve cognitive abilities and the ability to ask students about the concept of the human digestive system of Class VIII B SMP Negeri 7 Palu.

Conclusions

Based on the discussion and data analysis, the following conclusions can be drawn. The application of reciprocal teaching learning strategies can improve the cognitive abilities of class VIII B students. This is from the average of the first cycle of 66, which increased to an average of 88 in the second cycle and has reached the predetermined completeness criteria minimum of 70. The application of the reciprocal teaching-learning strategy can improve the asking questions of class VIII B students. The questioning ability in the first cycle the percentages are C1 72%, C2 60%, C3 56%, C4 56%, C5 44% and C6 12%, increasing in the second cycle the percentage is C1 76%, C2 64%, C3 68%, C4 68%, C5 60% and C6 48%. The application of reciprocal teaching learning strategies can increase teacher activity in class VIII B. The average teacher activity in cycle I was 60.83% increasing in cycle II to an average of 87.13%. The application of reciprocal teaching learning strategies can increase student activity in class VIII B. The average student activity in the first cycle was 55.86%, increasing in the second cycle to an average of 82.86%.

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