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Chemistry Learning Outcomes of 11th Grade Science Students at SMAN 1 Rasau Jaya

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Abstract

This study discusses the ineffective chemistry learning process resulting in poor grades at State Senior High School (SMAN) 1 Rasau Jaya, students tend to receive information from the teacher without constructing their own knowledge, so students have difficulty in constructing the material obtained from the teacher. The purpose of this study is to describe the learning outcomes of students in 11th Grade Science Class odd semester in chemistry subjects at SMAN 1 Rasau Jaya. The form of research used in this research is descriptive research, and the type of research is a case study. Case study is one of qualitative research, in which researchers conduct in-depth exploration of programs, events, processes, activities, for one or more people. The subjects of this study were students of 11th Grade Science Class at SMAN 1 Rasau Jaya in the 2019/2020 school year who took the odd semester general test, totaling 93 students. The research process includes three stages, namely the preparation stage, the implementation stage, and the final stage. The data collection tool used is the odd semester general test score. Results and Discussion regarding Indicator 1: List the general formula of alkane, alkene and alkyne compounds, Indicator 2: Mention the law of conservation of energy, Indicator 3: Determine the number of moles from the results of the experiment, Indicator 4: Determine the value of the equilibrium constant Kc based on the reaction. The results of the general test conducted on 11th Grade students of SMAN 1 Rasau Jaya can be concluded that the learning outcomes of students in the class are not adequate.

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INTRODUCTION

Chemistry is a science related to how to find out about natural phenomena systematically, so it is not only mastery of a collection of knowledge in the form of facts, concepts, or principles but also a discovery process. Slabaugh and Parson (in Effendy, 2002) reveal that chemistry is the science of the properties of substances, changes in substances, laws and principles that describe changes in substances, as well as concepts and theories that interpret or explain changes in substances. The laws, principles, and theories in chemistry are a combination of several concepts. Quality human beings depend on the quality of education that determines the excellence and progress of a nation, so the role of education is very important in creating quality human beings, namely humans who are intelligent, skilled, moral, democratic, and have the ability to compete (Wiyarsi and Partana, 2007).

Chemistry subject is one of the materials that are considered difficult by students. The difficulty of students in understanding chemistry is characterized by the inability of students to understand chemical concepts correctly (Huddle 2000). This is because in chemistry, one

concept is related to another concept so that students can understand a concept correctly. A complex concept or interrelated concept can be mastered correctly and well if the underlying concepts have been mastered correctly and well too. Therefore, chemistry lessons are expected to provide a complete understanding of the concept to students.

Rumansyah and Irhasyuarna (2002) revealed that there are three sources of difficulty for students learning chemistry (1) difficulty in understanding terms, (2) difficulty in understanding chemical concepts, and (3) difficulty in mathematical calculations. Sirhan (2007) revealed that chemistry topics are generally related to the structure of a material, this makes chemistry a difficult lesson for students. In addition, Gede (2012) revealed that chemistry examines things that are concrete and abstract in a unity making chemistry a complex lesson, so that a complete understanding is needed.

Wiyarsi and Partana (2007) reveal that quality human beings depend on the quality of education that determines the excellence and progress of a nation, so the role of education is very important in creating quality humans, namely humans who are intelligent, skilled, moral, democratic, and have the ability to compete. Improving the quality of education is very important for every element in every education including teachers and students. Students are less active in the learning process because students are less involved in the learning process. Students tend to receive information from the teacher without constructing their own knowledge, so students have difficulty in constructing the material obtained from the teacher.

This difficulty will have an unfavorable impact on student understanding. Chemistry concepts will be more specific in solving the material given, because the purpose of teaching chemistry itself is for students to master chemical concepts and their interrelationships. In chemistry learning, students are not only required to understand chemical concepts, but students must be able to construct the concepts they understand to solve a chemical problem. Anderson and Krathwohl (2010) revealed that students are said to understand the concept that can construct the knowledge gained to understand, apply, analyze, evaluate, and create in solving a problem.

One of the factors that affect the quality of student education is the teacher. Nana Sujana (2002) revealed that teachers occupy a central position, because their role is very decisive. Teachers must be able to translate and describe the values contained in the curriculum, then transform these values to students through teaching at school. Oemar Hamalik (2011) revealed that no matter how good the curriculum, administration, and equipment facilities are, if they are not balanced with improving the quality of teachers, they will not bring the expected learning results. According to Sadia in Ahmad (2012) the lecture method is the dominant method (70%) used by teachers, while the level of teacher dominance in teaching and learning interactions is also high at 67%, so that students are less active in the learning process.

Chemistry teachers at SMAN 1 Rasau Jaya still often use the lecture method to consider the amount of material that must be conveyed and to streamline learning time. The teacher's benchmark in explaining the material is smart students, if there are several students who understand the teacher's explanation, then the teacher will explain the next discussion. The teacher is more active in explaining the material, while students tend to be passive in the learning process. The teacher pays less attention to students who are noisy. Teachers tend to focus attention on some students only. Only a small number of students can absorb the material presented by the teacher, this is evident when given a problem only certain students can do the problems given by the teacher. Most students tend to be silent watching other friends come forward to do the questions.

Students tend to be silent when given questions, most likely students do not understand well the content of the material presented. Of course, the better the material that can be absorbed by students will produce good learning outcomes as well, this shows that the success of the

teaching and learning process is highly dependent on the involvement between teachers and students during the process of teaching and learning activities. Learning outcomes are a better level of mental development when compared to pre-learning. Learning outcomes are said to be good if there is an increase in students' mental development that exceeds the standards that have been set, namely the Minimum Completeness Criteria (KKM).

However, there is a symptom that shows low student learning outcomes in the cognitive domain, especially odd semester chemistry subjects in the 2018/2019 school year. This is reflected in the data on the value of the chemistry semester test results which are still below (KKM) set at 75.

Table 1. Percentage of Completeness of Odd Semester Test Score of 11th Grade Class at SMAN 1 Rasau Jaya 2018/2019 Academic Year

11th Grade Sceice Class	Completion
1	43,75%
2	41,20%
3	45,23%

Student incompleteness with an average of 45.23%. This shows that student learning outcomes are still low. The low completeness of student learning outcomes can be caused by various factors, namely student factors, factors outside students and the conditions of the learning process. This indicates that there are problems that have the potential to interfere with chemistry learning objectives. Broadly speaking, the factors that influence the learning process consist of two kinds, namely factors outside (external) students and inside (internal students). The background described above, the research to be carried out is related to "Description of Learning Outcomes of 11th grade Students at SMAN 1 Rasau Jaya ".

METHOD

This research is descriptive. According to Arikunto (2006), descriptive research is a problem-solving research investigated by describing or painting the state of the subject or object of research (a person, institution, society, etc.) at the present time based on the facts that appear or as they are. According to Nazir (2005), descriptive method is a method of examining the status of a group of people, an object, a set of conditions, a system of thought, or a class of events in the present.

The form of this research is case study research. Case study is one type of qualitative research, where researchers conduct in-depth exploration of programs, events, processes, activities, of one or more people. Case studies are bound by time and activities and researchers collect data in detail using various data collection procedures and over time (Sugiyono, 2013). The purpose of the case study in this study is to provide a detailed description of the learning outcomes of 11th grade students in odd semester chemistry subjects at SMAN 1 Rasau Jaya.

The research subjects were students in 11th Grade Science 1, Science 2, and Science 3 Class of SMAN 1 Rasau Jaya, 93 students who took the 2019/2020 odd semester general test. The research procedure in the preparatory stage of the researcher conducts an initial survey to find out the state of the research sample. In this case it concerns the readiness of schools and teachers and determines the research sample, compiles interview guidelines, and digs up literature in this case looking for information about analyzing the results of the final semester test.

The implementation stage conducts research and collects data. and the final stage analyzes the data obtained, describes the results of data analysis into the discussion and compiles a research report. Data collection techniques Sugiyono (2015) revealed that data collection can be done in

various settings, various sources and various ways. The data collection techniques used in this study are measurement techniques and direct communication.

Measurement Technique

Is a way of collecting quantitative data using test result data. The measurement activity in this study is to give a completion score per indicator on the test questions that students have done. According to Hadari Nawawi (2012), the measurement technique is a way of collecting data by establishing an indirect relationship or by intermediary tools in the form of tools that are already available or special tools for research purposes.

Direct Communication Technique

Direct communication technique is a data collection technique using interviews as a tool (Margono, 2010). The direct communication technique used is an interview test. Interviews are oral questions to data sources regarding the information needed. This direct communication is based on the needs of the researcher in accordance with the required data.

Data Collection Tools

Data collection tools are tools or facilities used by researchers in collecting data so that their work is easier and the results are better, in the sense that they are more careful, complete and systematic so that they are easier to process (Arikunto, 2010). The data collection tool used in this study is the odd semester test..

Using quantitative data measurement techniques using test results data, direct communication techniques conduct interviews to obtain the necessary data from the information party.

The technique of analyzing student end-of-semester test data was analyzed using descriptive analysis of the end-of-semester test percentage, where the data analysis steps are collect student answer sheets from the research conducted, correcting students' answers, and calculating the percentage of students' ability to answer each question using the following formula.

$$NP = SBSSx\ 100\%$$

While, NP = Percentage value sought; SB = Students who answered correctly; and SS = total number of students

The Percentage of student learning outcomes was interpreted according category as follows in Table 2.

Tabel 2. Percentage Interpretation

Percentage Value	Learning Outcome Category
81-100	Very Good
61-80,9	Good
41-60,9	Simply
21-40,9	Less
0-20,9	Very Less

RESULTS AND DISCUSSION

This research was conducted in the 2019/2020 school year in 11th Grade Science Class SMAN 1 Rasau Jaya. Data collection is based on the results of the odd semester general test in the 2019/2020 academic year with a total of 93 students. There are four will be described. Indicator 1: List the general formulas of alkane, acene, and alkyne compounds; Indicator 2: Mention the law of conservation of energy; Indicator 3: Determine the number of moles from the results of

the experiment; and Indicator 4: Determine the price of the equilibrium constant Kc based on the reaction

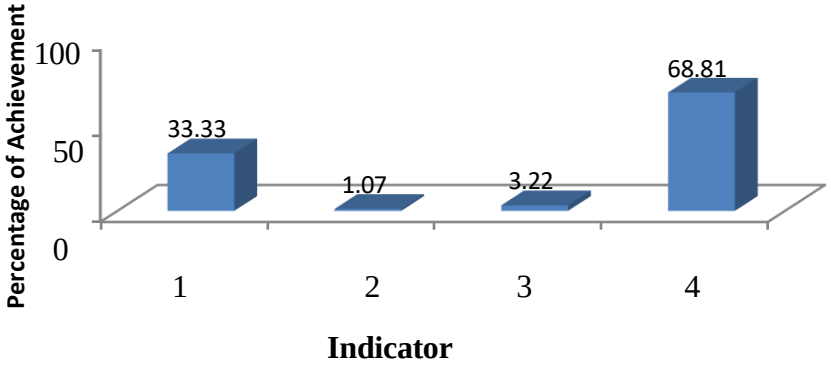

Figure 4.1 Graph of Odd Semester General Test Results 2019/2020 Academic Year (N=93)

A more detailed explanation of the description of student learning outcomes in the odd semester of the 2019/2020 school year for each indicator is as follows.

List The General Formulas of Alkane, Alkene, and Alkyne Compounds

This indicator contained 1 item that asked students to mention the general formula of alkenes. There were 31 students answered correctly, 7 students answered with point 1, 49 students answered incorrectly, and 6 students did not answer.

Students who answered correctly answered CnH2n. Students who answered CnH2+n the teacher gave 1 point because it was considered that the student's mistake was not fatal. For students who answered incorrectly, the students had varied answers. Most of the students with wrong answers answered by mentioning the names of alkene compounds and mentioning one formula of one of the alkene compounds. Based on students' answers to question number 1, it shows that there are 33.33% of students who are able to do the problem very well, students remember the lessons in the form of theories that have been delivered by the teacher. However, if the indicator completeness is calculated, it is still classified as a category that is lacking.

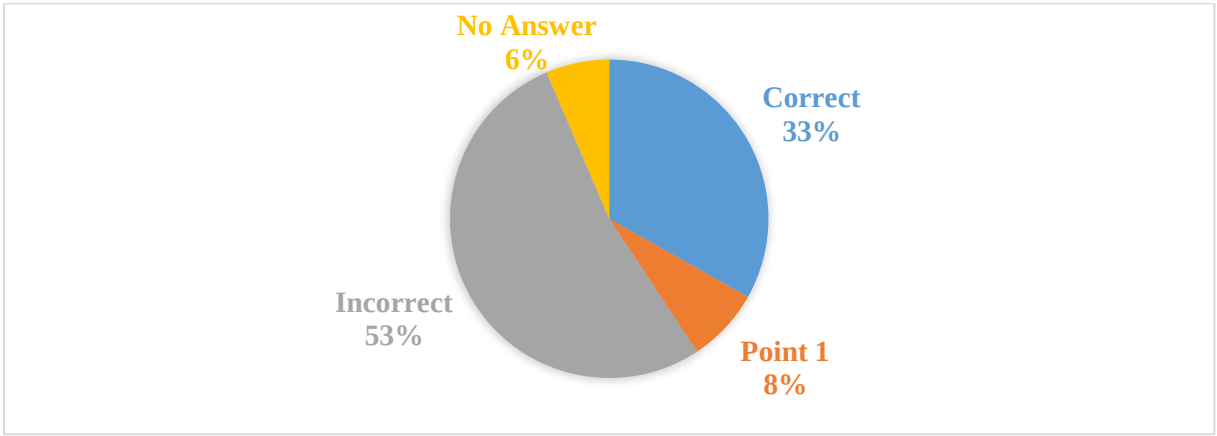

Figure 2. Learning Outcomes Indicator 1

In this case, the existence of this indicator is to help teachers and schools be more able to overcome shortcomings in the chemistry learning process at SMAN 1 Rasau Jaya to foster students' curiosity and desire to learn more so that they can improve the quality of the education process.

Mention The Law of Conservation of Energy

In this indicator, there is a question that asks students to mention the sound of the law of conservation of energy. There was only 1 student who answered correctly and precisely, 9

students answered with 1 point, 62 students answered incorrectly and 21 students did not answer.

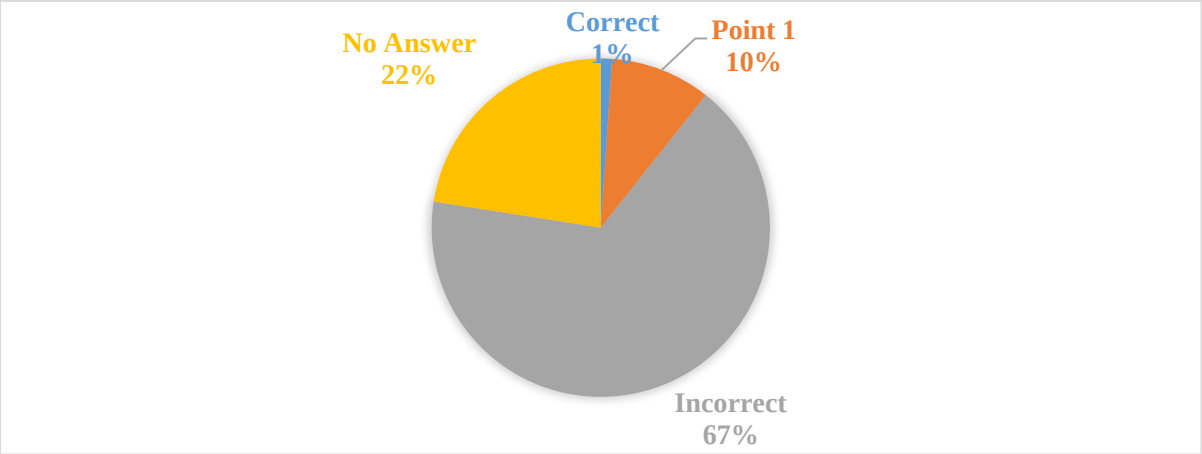

Figure 3. Learning Outcomes Indicator 2

Students who answered correctly mentioned that energy cannot be created/destroyed, but energy can be converted from one form of energy to another. The student answers and gets 1 point because the answer is incomplete. The student only mentioned that energy cannot be created/destroyed or only mentioned that energy can change from one form of energy to another. Next, there were 62 students who answered incorrectly, these students answered not according to the concepts that had been taught previously by the teacher. Based on students' answers to question number 2, it shows that there are only 1.07% of students who are able to do the questions very well, students remember the lessons in the form of theories that have been delivered by the teacher. However, if the indicator completeness is calculated, it has a very poor category..

1. Determine the number of moles from the results of the experiment

In this indicator there is a problem that asks students to find the HCl molecule contained in a 0.2 M HCl solution of 250 ml. There were 3 students who answered correctly and precisely, 15 students answered with point 1, 58 students answered incorrectly and 17 students did not answer.

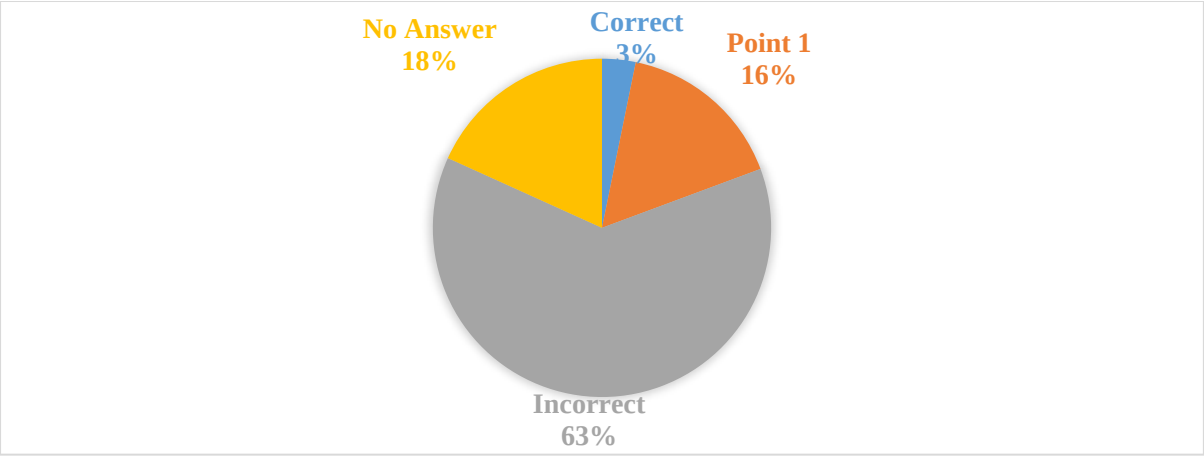

Figure 4. Learning Outcomes Indicator 3

Students who answered correctly were known and used the formula taught mol = M x V. Students who answered got point 1, namely students who only filled in the correct known or students who answered the correct calculation but were less precise in the units used. The unit

of volume should be liter (L) but students answer with milliliters (mL). For students who answer incorrectly, so the results obtained will be much different.

Based on students' answers to question number 3, it shows that there are only 3.22% of students who are able to do the problem very well, students remember the lessons in the form of formulas that have been delivered by the teacher. However, if the indicator completeness is calculated, it has a very poor category.

Determine The Equilibrium Constant Kc based on The Reaction

In this indicator, there are 2 questions, namely question number 4 and number 5, in the question the teacher asks students to determine the equation of the equilibrium concentration constant (Kc) based on the reaction given. Problem number 4 done there were 75 students answered correctly, 12 students answered incorrectly and 6 students did not answer. Problem number 5 which was done there were 53 students answered correctly, 33 students answered incorrectly and 7 students did not answer.

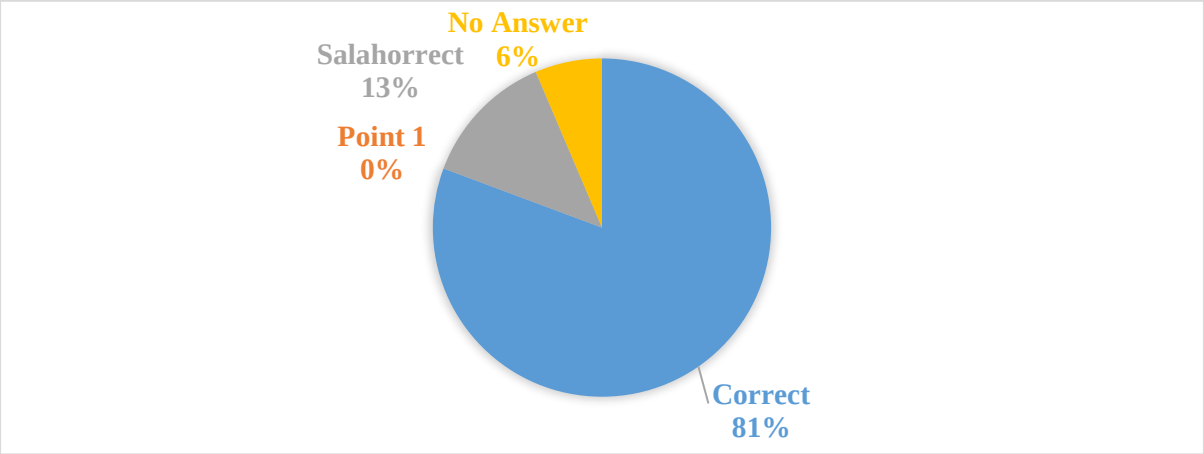

Figure 5. Learning Outcomes Indicator 4 Question Number 4

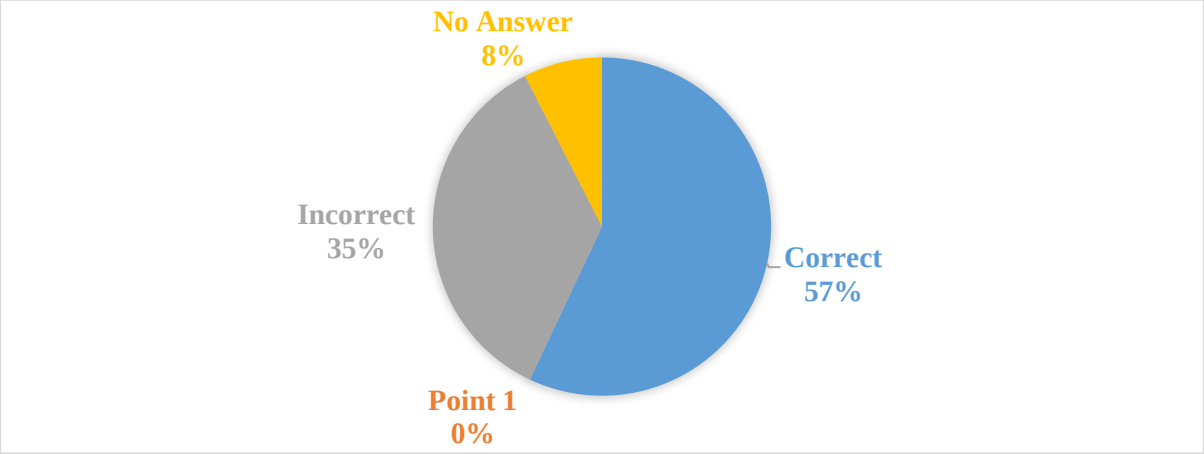

Figure 6. Learning Outcomes Indicator 4 Question Number 6

In two questions, 51 students answered both correctly using the formula Kc = productrectant. There were 24 students who answered correctly on question number 4 and incorrectly on question number 5. Students who answered only correctly on one of these questions because students were reversed in using the formula regarding the value of equilibrium constancy. The price of Kc should be written productrectant but students answer productrectant in the other answer. Students who answered incorrectly were wrong in the change of rank which was previously as a concentration. Based on students' answers to questions number 4 and 5, it shows that there are 68.81% of students who are able to do the questions very well, students remember

the lessons in the form of formulas that have been delivered by the teacher. If calculated, the completeness of the indicator has a good category.

The results of interviews with chemistry teachers, teachers still often use the lecture method to consider the amount of material that must be conveyed and to streamline learning time. The teacher's benchmark in explaining the material is smart students, if there are several students who understand the teacher's explanation, then the teacher will explain the next discussion. Teachers are more active in explaining the material, while students tend to be passive in the learning process. The teacher pays less attention to students who are noisy. Teachers tend to focus their attention on only some students. Only a small number of students can absorb the material presented by the teacher, this is evident when given a problem only certain students can do the problems given by the teacher. Most students tend to be silent watching other friends come forward to do the questions.

The learning process carried out by teachers and students is very ineffective, making the percentage of the chemistry learning process very poor, students' interests and talents also do not grow due to the teacher's lack of understanding of the sustainability of teaching and learning activities which should be a difficult chemistry learning process but must remain optimal and enjoyable for students so that their learning outcomes can not only answer difficult chemistry lessons but in the process of learning chemistry becomes easier.

Learning outcomes are obtained from an interaction of learning and teaching actions. From the teacher's side, teaching and learning actions end with the process of evaluating learning outcomes. In terms of students, learning outcomes are the culmination of the learning process which is evidence of the effort that has been made. Learning outcomes are essentially changes in a person's behavior that include cognitive, affective, and psychomotor abilities after following a certain teaching and learning process. Education and teaching are said to be successful if the changes that appear in students are the result of the teaching and learning process they experience, namely the process they go through the programs and activities designed and implemented by the teacher in the teaching process. Based on student learning outcomes, the ability and development as well as the level of educational success can be known. Hamalik (2008) reveals that learning outcomes appear as changes in behavior in students, which can be observed and measured in changes in knowledge, attitudes, and skills.

CONCLUSION

Based on data analysis, conclusions can be drawn that teaching and learning activities carried out by teachers lack creativity so that students feel bored and bored, chemistry lessons are one of the materials that are considered difficult by students. Students are less active in the learning process because students are less involved in the learning process, students tend to receive information from the teacher without constructing their own knowledge, so students have difficulty in constructing the material obtained from the teacher. In the 2019/2020 school year, 11th Grade Science Class SMAN 1 Rasau Jaya. Data collection based on the results of the odd semester general test in the 2019/2020 academic year with a total of 93 students. is the learning outcome of students in 11th Grade Science Class odd semester in chemistry subjects at SMAN 1 Rasau Jaya has an average indicator completeness percentage of 26.61% in less category.

RECOMMENDATIONS

Some suggestions that can be conveyed based on the results of this study are expecting that students should use the time provided as efficiently as possible so that they can do all the questions given by the teacher while carried out the test and hoping this study can be refined

and reduce the weaknesses that exist in this study, for example, interviewing students who find it difficult to work on problems.

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