
STUDENT DIFFICULTY ANALYSIS IN COMPLETING CHEMISTRY ODD SEMESTER EXAM

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ABSTRACT

The problems obtained by the researcher in Senior High School 5 Takengon Central Aceh show that most students have difficulty solving odd semester exam questions in chemistry learning. This study aims to determine what difficulties students face and what factors cause students to have difficulties. The method used in this research is descriptive method with a qualitative approach. Data were collected through tests, questionnaires, and interviews. Data were analyzed descriptively and qualitatively. The results obtained indicate that students have difficulty in chemical calculations, exothermic and endothermic reactions, and the concept of chemistry equilibrium; the factors that affect students' difficulties in solving odd semester final exam questions on chemistry are the students' physical condition, students' motivation, and interest and students' low mathematical abilities.

Keywords: chemistry learning, difficulty analysis, the questions of exam

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1. INTRODUCTION

Learning process is one of the issues that always actual and faced by almost all education practitioners. The learning process is an attempt made by a person to obtain new behavior changes as a result of their interaction with the environment. Meanwhile, the teaching and learning process is a process that contains a series of teacher and student actions based on the reciprocal relationship that takes place in educational situations to achieve certain goals (Irham et al, 2017).

Nurjanah et al. (2019) stated that there are several factors which affect students' learning,

such as internal factors (from within students) including physical and psychological conditions of students; external factors (from outside the student), namely the environmental conditions around the student. In addition, factors that influence learning include: teacher, student, and curriculum factors. If one of these factors does not support the learning process, students will experience learning difficulties.

Chemistry is one of the branches of natural sciences. Chemistry is a science that learns about the composition of properties, chemical structures, changes in matter and energy that involved these changes. Studying chemistry emphasizes more on mastery of concepts in solving chemical problems and calculations.

Chemistry is one of the subjects that tends to be considered difficult by some high school students. That problem caused by chemistry concepts are considered abstract and tends to many calculations and equations of chemical reactions, Sumiharsono (2017) states that learning is a series of obstacles that occur in a person in a learning atmosphere, such as difficulty in understanding lessons, slow absorbing knowledge, not being able to describe, and reanalyze learning that has been learned.

Oktavianita et al. (2019) added that the success of a learning can be known from the final results of learning, one of them is the ability to solve exam questions. If the learning results indicate a high level of students' final grades, then learning will be considered successful, and vice versa, the lower the level of student achievement means that learning is less successful or effective. The difficulty of learning chemistry can be known from the low achievement of the student exam, one of which is the final exam of the semester in chemistry lessons.

According to Anggraini et al. (2017) the difficulties faced by students in answering questions about the solubility product constant (KSP) include: difficulty in understanding the redaction of the question sentence so that there is no solution to the problem, difficulty in understanding the definition of molarity related to solubility, errors in linking mole concepts with solubility product constant equations, difficulty in understanding solubility and solubility product constant concept and the last is difficulty in calculations.

Furthermore, Boncel et al. (2017) in his research explained that the forms of mistakes made by eleventh grader science students in solving questions about salt hydrolysis are: errors in understanding essential concept, errors in understanding the relationship between one concept and another, and errors in understanding use of concepts that have been learned in solving a problem. The inaccuracy factor of the student when

answering the question is the main factor of the mistakes.

This study aims to find out the difficulties faced by students in completing odd semester final exams in chemistry learning and to find out the factors that cause students to have difficulty in completing the exam. Based on observations made at Senior High School 5 Takengon, information was obtained that there are some students in grade 11 science who have difficulty in answering the question of the odd semester final exam of the 2018/2019 school year in chemistry subjects. Out of a total of 47 students who took the final exam, only 23 students answered 10 to 20 question items correctly out of a total of 30 question items available, this indicates that most students have difficulty answering chemistry final exams. The interview was also conducted with one of the chemistry teachers at Senior High School 5 Takengon to find out the obstacles experienced by students in completing final exam in chemistry subjects. The information obtained is that students have difficulty in solving questions related to chemical calculations, for example in thermochemistry and reaction rate.

It is related to the process of implementing learning and also the background of students in following the chemical learning process thoroughly. The research questions in this study relates to how the difficulties faced by students in answering the semester final exam questions in chemistry subjects and what are the factors that cause students to have difficulty in answering the exam questions. Researchers are interested in conducting research related to students' difficulty in answering semester final exams in chemistry subjects at Senior High School 5 Takengon Aceh Tengah. This study aims to find out the difficulties faced by students in answering semester final exams in chemistry subjects and also to find out the factors that cause students to have difficulty in answering the exam questions.

2. RESEARCH METHOD

This research used a qualitative approach, in which in qualitative research, the condition of the object is in its natural state and the researcher must act as a key instrument. Data collection techniques were carried out in combination and data analysis was inductive, and qualitative research results emphasize more on meaning than generalization. The type of research used in this research was descriptive. Descriptive research here is intended to expose, describe and map facts based on a pre-designed way of looking or thinking.

In this study, researchers attempted to describe the research activities carried out on certain objects clearly and systematically. What will be described in this research was related to the difficulties faced as well as the factors that affect the eleventh graders of science at Senior High School 5 Takengon in answering the odd semester final exam questions on chemistry subjects. This research was conducted at Senior High School 5 Takengon which is one of the high schools in Central Aceh Regency in Jagong Jeget sub-district.

The subjects in this study were chemistry teachers and 47 students of eleventh grade science at Senior High School Takengon in the 2018/2019 school year. Sampling techniques for the subject of this research were determined by purposive sampling techniques, namely sampling techniques as sample of data sources with certain considerations. The samples used in this study were 12 students in eleventh grade who had difficulty in answering the final exam questions of chemistry subjects and 2 teachers at Senior High School 5 Takengon.

Data collection instruments used by researchers in this study were documentation, tests, questionnaires, and interviews. While that process used triangulation techniques, that combine from various data collection techniques and existing data sources. As for data collection in this study, researchers used tests, questionnaires, and interviews.

The process of collecting data in this research was obtained after previously obtaining permission from Senior High School 5 Takengon to conduct research. As a first step, research data collection procedures starting from the pre-research stage (stage to find out the problems faced by students in the learning process). Before heading to the research site, researchers designed all data collection instruments required in the research. The initial data collection procedure was carried out by studying documents related to the research topic, namely the results of semester examinations in eleventh grade chemistry subjects.

3. RESULT AND DISCUSSION

Based on the student's exam results, then examined to find out the items of the question that are considered difficult by the students by looking at the student's error level in answering the question. After obtaining a question that is considered difficult, the test is again carried out with the same question but accompanied by reasons when answering it, so that can be seen the various difficulties experienced by students in answering the question.

In this study, researchers focused on three types of difficulty, i.e. the difficulty in understanding terms, the difficulty in understanding concepts, and the difficulty in mathematical calculations. To find out other factors that affected students having difficulty in answering questions, researchers shared an open questionnaire about the difficulty of answering exam questions so that supporting data was obtained. After all data about respondents were collected, then an analysis of the data was conducted qualitatively.

Interview was also conducted after the giving of tests and questionnaires. Interviews were conducted on teachers as well as several students who took the final exams of the semester in chemistry subjects. The purpose of this interview was to find out in depth about the difficulties experienced by students when answering the odd semester chemistry exam questions and the factors that affected.

Interviews conducted with students were held three times in order to obtain valid data. Interview results were summarized into a research note to strengthen the data of test results and questionnaires.

The results of research conducted at Senior High School 5 Takengon showed that there are still many students who have difficulty in completing chemistry exam questions in the

odd semester. Research showed that there are several problems related to students' difficulty in answering chemistry exam questions. The difficulty of students in answering the odd semester final exam questions in chemistry subjects can be seen from the large number of students who can not answer the exam question, as stated in Table 1 below:

Table 1. Students' Test Results at Senior High School 5 Takengon

Number	Question Number	Number of Students Who Answered Correctly	Number of Students Who Answered Wrong	Total Number
1.	1	5	7	12
2.	2	2	10	12
3.	3	2	10	12
4.	4	5	7	12
5.	5	2	10	12
6.	6	2	10	12
7.	7	6	6	12
8.	8	1	11	12
9.	9	4	8	12
10.	10	3	9	12

Based on the results of the odd semester final exam analysis on chemistry subjects, it is known that the difficulties faced by students in grade eleven majoring in science at Senior High School 5 Takengon Aceh Tengah are focused on 3 things, i.e. difficulties in chemical calculations, concepts about distinguishing exotherm and endotherm reactions, and difficulties in understanding the concept of chemical equilibrium. This can be found based on the alternative answers chosen by the student and also from the reasons given by each student in the answer sheet column.

When reviewed the results of the analysis of the test results given to the students above, in general, students are more likely to find it difficult to answer questions related to calculations such as in questions number 5, 7, 8. However, when students answered questions about understanding concepts such as questions number 4 and 10, students also have difficulty because lack understanding of the concept. Most students tend not to be able to remember the things that have been

learned, causing difficulty in answering these questions.

Difficulty in understanding the concept also make it difficult for students when answering questions such as number 9, where students lack in understanding the concept of moles, consequently wrong in converting the formula to be used. Based on the results of analysis of tests and interviews with students, there were three difficulties experienced by students in answering the chemistry exam questions of the previous odd semester, namely difficulty in understanding some chemical concepts in the odd semester of the eleventh grade, difficulty in understanding the formulas and converting them, as well as difficulties in terms of mathematical calculations.

The first difficulty faced by students is the difficulty in understanding some chemical concepts in the odd semester of eleventh grade. There were 10 students who are wrong and have difficulty in answering questions about the terms exothermic and endothermic, because students tend to lack understanding

how the reaction is said exothermic and endothermic, students have difficulty in understanding the terms. Students understand that the exothermic reaction is a reaction where the heat flows from the system to the environment so that the enthalpy change will be marked negatively, while in the answer option there is no answer stating this so that students tend to guess the answer that is close to the statement.

Difficulty in understanding some chemical concepts is also identified in the concept of chemical equilibrium. Student answer results showed that students tend to be confused about choosing the right answer to the question. Students tend to choose answer option A because they think equilibrium will be achieved when in a reaction, the number of molecules between reactant and product is the same or the number of molecules in the left and right segments is the same.

The difficulty in understanding other chemical concepts can be seen in the students' difficulty in answering questions about exothermic and endothermic reactions in question number 3. Only 2 students were able to answer the question correctly, and 10 other students answered incorrectly on question number 10. This is because students only memorized a few terms without understanding the meaning of the term. So that sometimes students make a mistake when explaining a term. This is supported by Farid (2015) who stated that learning difficulties are a series of obstacles that occur in a person in a learning atmosphere, such as difficulty in understanding lessons, slow absorbing knowledge, unable to describe and reanalyze learning that has been learned, and so on.

This is also supported by the results of research conducted by Yakina et al. (2017) which stated that on the description questions, students still have difficulty in understanding the term, it is because students are still unable to master some chemical concepts because students seem to memorize only a few terms in chemistry and do not understand them so they feel confused when answering questions. The results were also

strengthened through data from interviews by researchers with several students. Summary of interview results between researchers and sources (students) can be seen in Table 2.

Table 2. The Interview Results between Researchers and Students at Senior High School 5 Takengon Aceh Tengah

Researcher	What difficulties do you think are experienced during learning?
Sources	Chemical concepts that use formulas and calculations are difficult.
Researcher	What are the most difficult chemical concepts in odd semesters?
Sources	Chemical equilibrium and exotherm and endotherm reaction.
Researcher	Why do you have difficulty answering semester final exams in chemistry subjects?
Sources	The questions discussed while studying in class have differences in numbers with the questions at the time of testing.
Researcher	What difficulties do you think you have when answering semester exams?
Sources	The difficult thing is memorizing the formulas, the number of calculation questions are many and not enough time to calculate, and often mistakenly use the formula.
Researcher	What factors do you think make it difficult for you to answer semester exams?
Sources	Less practice and most students need more time to understand the lessons taught.

Difficulty in understanding other chemical concepts can be seen in students' difficulty in answering questions about ΔH reaction. Based on the answers given, students who answered on answer option A have difficulty because they do not understand the meaning of the question, this is seen because the student directly answer the question that the ΔH reaction is fixed -242 kJ, because students consider that the enthalpy of formation of H_2O -242 kJ is the value of ΔH reaction to the

reaction below. Whereas ΔH reaction known on the question is ΔH reaction for the formation of H_2O , while ΔH reaction asked is ΔH reaction to the decomposition reaction of $2H_2O$, in that section, students do not understand the questions asked. Students who answered option B also experience errors in understanding questions and difficulties in the concept.

The next difficulty faced by students is the difficulty in understanding the formulas of chemical calculations. The test results showed that students do not understand the formulas used in chemical calculations. The difficulty can be seen from the answers of students who do not understand formulas such as formulas looking for concentration, calorific capacity, and enthalpy formation as in questions number 4, 5, and 8, and also the difficulty of students in converting the formula.

The results of an interview with one of the chemistry teachers also stated that students lack in understanding the concept and mapping of formulas. Low levels of intelligence and difficulty in understanding materials taught by teachers can cause students difficulty in understanding concepts about chemistry. Farid (2015) stated that students who have a high level of intelligence will be easy to learn while students who have a low level of intelligence or carrying will be difficult to learn.

This is supported by Munandar (2018) and Mujakir (2018), in their articles that said that concepts in chemistry are generally tiered. In understanding higher-level concepts, it is necessary to properly understand the concepts that are more basic. In addition, to understand chemistry students must be able to use three levels of representation, namely macroscopic, submicroscopic, and symbolic. Macroscopic representations include macro phenomena that can be observed and viewed directly, submicroscopic relates to abstract concepts such as atoms, molecules, ions, while symbolic representations include symbols, formulas and reaction equations. To improve learning activities, teachers can utilize teaching materials based on 3 levels of

representation (macroscopic, symbolic and sub-microscopic).

Mujakir and Rusydi (2019) added that students' ability to explain concepts is so lacking that it can be helped by using 3 levels of chemical representation through learning strategies based on multi-level chemical representation. To support the implementation of the strategy, learning devices consisting of teaching materials and LKPD are designed based on 3 levels of chemical representation.

The last difficulty faced by students is related to mathematical studies or difficulties in mathematical calculations. The problem that students gotten is the difficulty in understanding the formula used in mathematical calculations on mole concept. This is because students do not understand what formula to use to solve the problem, so that students tend to answer by guessing only. There were 3 out of 7 students who incorrectly answered the question who can only write down the known things, but can not complete the calculation because they can not write the formula.

This can be seen from the answer of one of the students, where the students consider that the question is a question of finding the concentration of solution in molarity, students misinterpreted that 750 grams of water in the solution for the volume value of the solution (V), so that students immediately multiplied 750 by the amount of the calculation of the solution mole that is the division of grams/relative molecular mass so that the concentration of the solution is obtained by 1,125 molars and chose the option answer C because the value is closer than the result obtained. Whereas in the question, the value of 750 grams of water is the value of the water mass (p) which refers to the formula for finding the concentration of the solution in the molality.

The test results showed that some students have difficulty answering chemical questions related to calculations, such as the questions in numbers 5, 6 and 7. Difficulty in calculations

experienced by students is difficulty when turning the formula, students are also less thorough in performing chemical calculations so that students tend to have difficulty when answering exam questions in which there are calculations. Difficulties in this calculation cause students to consider chemistry is a difficult lesson.

Anggraini (2017) in her article stated that chemistry lessons are inseparable from mathematical calculations, where students are required to be skilled in mathematical formulations/operations. But often found students who do not understand the formulation. This is because students do not know the basics of good mathematics, students do not memorize mathematical formulations that are widely used in chemical

calculations, so students are not skilled in using basic mathematical operations.

The next step was the result of questionnaire analysis given to students with the aim of obtaining additional information related to the problems faced by students when taking the final exam of the semester in chemistry subjects. Based on the results of the questionnaire that has been obtained, the factors that cause students have difficulty in answering the chemistry exam questions can be described based on the analysis of the results of the questionnaire in Table 3.

Table 3. Student Responses and Students' Difficulties in Completing Odd Semester Chemistry Exam Questions

Number	Statements	Answer frequency			
		SA	A	D	SD
1	In my opinion, chemistry is an easy lesson.	0	5	7	0
2	In my opinion, chemistry lessons are fun and I'm interested.	0	6	6	0
3	I don't understand all the chemistry in the odd semester of eleventh grade.	2	6	4	0
4	In my opinion, the question of the final exam of odd semester in chemistry subjects is not easy for me to answer.	2	6	4	0
5	In my opinion, question number 21 about the concentration of solution is the most difficult question.	3	9	0	0
6	In my opinion, the odd eleventh semester chemical material that I find most difficult to understand is chemical equilibrium.	1	8	3	0
7	In my opinion, learning without practicum made me less understanding of the concept.	4	4	4	0
8	The teaching methods used by teachers made me easy to understand chemicals.	0	5	7	0
9	I find it difficult to answer questions related to chemical calculations.	3	8	1	0
10	I find it easy to answer questions about definitions and terms in chemistry.	4	6	2	0
11	When I have problems with my family and close friends, the situation has no effect on my learning concentration.	2	0	7	1
12	I always study chemistry the night before the exam the next day.	1	6	4	0
13	I often forget what I learned while I was on the exam.	7	5	0	0
14	In my opinion, my motivation to learn chemistry is low, so I have difficulty in answering chemistry exams.	1	9	2	0
15	When I'm not well, I have difficulty understanding the concepts I'm learning and it's hard to focus on answering exam questions.	7	5	0	0

Based on the data in Table 3, it can be known that there are several causes of students having difficulty in answering the final exam of chemistry subject as follows:

The first factor is related to students' motivation and interest in chemistry learning. This factor is an internal factor that causes. Based on Table 3, it can be seen that students have difficulty due to low student learning motivation in chemistry subjects. This can be seen from 12 students, 9 students answered agree (A), while 1 student answered strongly agreed (SA) and 2 students answered disagree (D) if their learning motivation is low in studying chemistry. One of the students who answered agreed, arguing that chemistry is a difficult lesson so that it lacks the motivation to learn it.

The results of an interview conducted with one of the chemistry teachers at Senior High School 5 Takengon also stated that one of the obstacles in the process of teaching chemistry in high school is the low motivation of students' learning towards chemistry subjects. The low motivation factor causes students to have difficulty in answering odd semester final exams in chemistry subjects. The results of this interview are in line with the results of the questionnaire that has been discussed previously.

Students' interest in chemistry is also relatively low or high, this can be seen from the results of a student questionnaire that showed there were 6 students who are interested in chemistry lessons and 6 other students lack interest in chemistry lessons. Students who answered are not interested in chemistry learning because chemistry is difficult to understand. While one of the students agreed that chemistry is what he was interested in and considered that chemistry is fun and a lot of new things are gained when studying chemistry.

The second factor is the student's lack of math ability. Based on Table 3, there were 8 out of 12 students answering agree (A), while 3 students answered strongly agreed (SA) on the statement that students have difficulty in answering chemistry questions about

calculations. This indicated that most students have difficulty when it comes to calculations or numbers. Difficulty in answering questions about chemical calculations caused by students' lack of ability in mathematics, Difficulty in answering questions about chemical calculations is caused by the lack of ability of students in mathematics, such as the ability to convert from symbols to numbers so as to obtain incorrect calculation results.

Based on the data above, students find the difficulties to answer questions about chemical calculations, namely the ability to convert from symbols to numbers, obtain incorrect calculation results. This is because students do not master formulas and how to enter numbers into formulas resulting in incorrect answers. The results of an interview conducted with one of the chemistry teachers at Senior High School 5 Takengon also stated that the factor that causes students to have difficulty in answering the final exam questions of chemistry subjects is the lack of training, and when given a slightly different question with the example given, students will have difficulty in answering the question, this is due to the lack of formula and concept mapping skills in students.

The third factor is the physical state of the student and the carrying factor. Based on the results of the questionnaire that has been given to the students, the physical condition of the student affects in learning and answering questions. From Table 3 it can be seen that 7 students gave a strongly agreed answer (SA) with a statement about the physical or health condition affecting the learning process and answering exam questions and the rest answered agreed (A). This is because when the physical health condition is not good, then students are less able to focus on studying chemistry. In addition, the results of an interview with one of the students stated that students often forget the concepts studied so that when answering questions tend to have difficulty.

The fourth factor is related to the learning methods applied in the classroom during the learning process in chemistry subjects. Based

on Table 3, it can be seen that 7 out of 12 students answered disagree (D) on the statement "learning method used by the teacher makes it easy for students to understand the concept taught", while 5 other answer agree (A). Learning methods implemented in the classroom are external factors that can cause students to have difficulty in learning and answering questions. Students who answered disagree (D), largely reasoned that students are difficult to understand the concepts obtained in the classroom.

The next step was the result of analysis based on the results of interviews conducted to a teacher and 12 students. The information obtained is that some students stated that teachers rarely schedule practicum activities in the laboratory. In one semester sometimes only one practicum is held even sometimes not at all. So that the concepts that should be better understood by students by practicing is not obtained, students only know the theory without practice directly, so that students have difficulty in understanding the concept and cause students to have difficulty when answering exam questions about the material.

The results of the interview were conducted on two chemistry teachers at Senior High School 5 Takengon. They argued that students' learning motivation is low in chemistry subjects so that when learning in class, they will have obstacles in terms of the spirit to follow the learning seriously. While the factors that greatly affect students have difficulty when answering the odd semester final exam questions in chemistry is the lack of practice and basic knowledge of mathematics students are lacking, making it difficult for students to map formulas and concepts.

Based on the results of interviews conducted with students and teachers directly, researchers can explore the problems experienced in the learning process. These problems can be broadly caused by two factors, namely internal and external factors.

Internal factors that cause students to have difficulty in answering chemistry exam

questions in odd semester are factors of the student himself, such as the motivation and interest factor of the student, the student's mathematical ability factor, and the physical state and carrying of the student. While external factors that cause students to have difficulty in answering chemistry exam questions are such as problems in the learning methods used by teachers are less understandable to students.

The results are also in line with the test results and questionnaire results that have been described previously. Both factors have a role in the problems experienced by students when completing odd semester final exams in chemistry subjects.

The results of the interview are a reinforcement of the questionnaire results analysis, for example related to the physical condition factor of students is one of the important factors that influence student learning success. Students who tend to be in a bad state, will have a tendency to difficulty in understanding the material studied, thus causing students to have difficulty in answering questions because they lack master the concept. This is supported by Wood and Derek (2017) who stated that factors that affect the learning process of students who are physical are due to illness or suffering from body defects. If people are always sick (headaches, colds, fevers) resulting in lack of passionate learning, psychologically often experience impaired thoughts and feelings of disappointment due to conflict.

Low intelligence level factor is also one of the reasons that caused students have difficulties in answering exam questions. Students who have a low level of intelligence tend to find it difficult to understand concepts and often forget the material they have studied. The results of interviews with students stated that students often do not recall the material that has been studied. When in class students have understood the concept described by the teacher, but if they have learned other materials then the students tend to forget about the concept that has been studied. Students need experience to understand

things that are difficult and easily forgotten. According to Sumiharsono (2017) the less experience students get, the less abstract knowledge is received, and on the contrary, the more experience the learner gets, the more concrete the knowledge will be developed.

This is supported by Muhibbinsyah (2015) who stated that everyone's abilities have different levels of. Students who have a high level of intelligence will be easy to learn while students who have a low level of intelligence or carrying will be difficult to learn. Ismayani (2016) explained that the application of learning will greatly influence the development of students' creative attitudes.

The similarity of the interview results with the results of the next questionnaire analysis is related to the motivation and interest factor is one of the most important factors in influencing students' learning. Based on the questionnaire that has been given to students, it can be seen that students have difficulty in answering odd semester final exam questions in chemistry subjects due to low student learning motivation in chemistry subjects. This can be seen from 12 students, 9 students answered agree (A), while 1 student answered strongly agreed (SA) and 2 students answered disagree (D) if their learning motivation is low in studying chemistry. While 6 out of 12 students answered interested in chemistry lessons. This can be seen from the test results of students who generally have difficulty in answering questions because the interest and motivation of students towards chemistry learning is low, so to understand chemistry will be low and cause students to have difficulty in answering exam questions.

Students who have high motivation and interest will tend to be passionate in studying chemistry, and vice versa. If the student lacks enthusiasm in learning then the student will not understand the material, so the student has difficulty when answering the exam question.

Furthermore, Muhibbinsyah (2015) explained that motivation is a change of energy in a

person that is characterized by an impulse that comes from one's self to do something. The encouragement and reactions caused by the need to excel in life. This makes individuals have the effort, desire, and drive to achieve high learning outcomes. Motivation is self-encouragement, generally because of the awareness of the importance of something.

The results of the interview also alluded to the student's mathematical ability factor. Mathematics is one of the skills that must be possessed by students in studying chemistry. Students' lack of math ability can make it difficult for students to answer chemistry questions consisting of various calculations, not just theory or terms.

Based on Table 3, there were 8 out of 12 students answering agreed (A), 3 students answered strongly agreed (SA) on the statement that students had difficulty in answering chemistry questions about calculations. This indicated that most students have difficulty when it comes to calculations or numbers. The difficulty in answering questions about chemical calculations is due to the lack of mathematical ability in students, both in the ability to sum and in mapping a calculation formula in chemistry.

Yakina et al. (2017) in his article stated that on the question of calculation students do not understand the formula of chemical calculations, do not know the basics of mathematics well, and only memorize chemical formulas, but not applied in question exercises so when answering questions students are confused and unable to answer.

In addition to student-related factors, problems also exist in external factors that affect students' difficulty in answering odd semester questions in chemistry subjects. Based on questionnaires and interviews conducted to students, there are external factors that affect students' difficulty in answering questions, namely factors related to learning methods used in the classroom during the chemistry learning process.

This is supported by the results of previous research that has been done by Ristiyan and Bahriah (2016) stated that: Learning difficulties are caused by several factors, including: external factors, in this case that include environmental factors both social and natural as well as instrumental factors that include curriculum, programs, facilities and infrastructure, and teachers. Internal factors, which include physiological conditions such as physiological conditions and five senses. As well as psychological interests, intelligence, talent, motivation, and cognitive abilities.

4. CONCLUSION

Based on the results of research and data analysis that has been described before, the researchers can draw conclusions, namely: students have difficulty in chemical calculations, exothermic and endothermic reactions, as well as concepts of chemical equilibrium. Factors that influence students' difficulty in completing odd semester final exam questions in chemistry subjects are the physical state of the student, the motivation and interest of the students as well as the students' low mathematical ability, namely the ability to convert from symbol to number so that incorrect calculation results are obtained. External factors that affect students' ability to answer chemistry questions are also related to learning methods used in the classroom during the chemistry learning process.

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