Journal of Chemical Learning Innovation
Vol. 1, No. 1, June 2024, pp. 7~13
ISSN: 3063-0886, DOI: 10.37251/jocli.v1i1.1017

Increasing Student Learning Motivation Using Inquiry Methods in Chemistry Lessons

Endang Ningsih
Public High School 6 South Bengkulu, Indonesia

Article Info

Article history:

Received Mar 12, 2024
Revised Apr 8, 2024
Accepted May 13, 2024
Online First Jun 25, 2024

Keywords:

Chemistry
Inquiry Method
Lesson
Motivation
Student

ABSTRACT

Purpose of the study: This research aims to describe increasing students' learning motivation using the inquiry method in chemistry subjects in Class X of Public High School 6 South Bengkulu.

Methodology: In this research, the subjects were class X C students at Public High School 6 South Bengkulu, totaling 41 students. The object of this research is the application of inquiry methods in learning. The type of data obtained from this research is qualitative data. This data was collected using observation and documentation techniques. The data collection tools used were tests, observation sheets of teacher and student activities. Description The action research procedure was carried out in 2 cycles. Each cycle consists of planning, implementation, observation and reflection. Indicators of success are shown by the fulfillment of predetermined motivation indicators.

Main Findings: In cycle I, indicator achievement was only 16.67%, while in cycle II achievement was 100% of the indicators set by the author and based on the targets set by the author. Based on the results of the research above, it can be concluded that using inquiry strategies can increase students' learning motivation in class.

Novelty/Originality of this study: The novelty of this research is to determine the effectiveness of increasing student learning motivation by using the inquiry method in chemistry lessons.

Corresponding Author:
Endang Ningsih,
Public High School 6 South Bengkulu,
JL. Raya Kayu Kunyit, Kec. Manna, Kab. Bengkulu Selatan Prov. Bengkulu, Indonesia
Email: endang_ningsih81@gmail.com

1. INTRODUCTION

Education plays a very important role in human life because education is a primary need that is essential for survival, both from a worldly and spiritual perspective [1], [2]. Education is not only limited to mastering knowledge and skills, but also includes the development of individual character and morals. Through education, a person or individuals strive to achieve maturity in accordance with their needs and abilities, and develop themselves as a whole [3]. This development covers various aspects of life, including personal, social, moral, technical and intellectual aspects. Education provides a foundation for individuals to contribute positively to society and live a meaningful and quality life [4], [5]. Therefore, education must be the main concern of all parties, especially schools as formal educational institutions which have a strategic role in educating and forming the next generation [6]. Schools are not only responsible for providing academic instruction, but also for forming strong character and moral values in their students [3], [7]. Therefore, cooperation between family, community and government in supporting the educational process is very necessary so that educational goals can be achieved optimally.

Students' learning motivation is a key factor in determining their academic success. This motivation can arise from various sources, both internal and external [8]. Internally, curiosity, interest in the subject matter, and the desire to achieve high achievement encourage students to study diligently and consistently [9]. Meanwhile, external factors such as support from family, encouragement from teachers, and a supportive learning environment also play an important role in motivating students [10]. Rewards and recognition for students' efforts and achievements can also increase their enthusiasm for learning [11]. In addition, innovative and interesting teaching methods, such as the use of technology, educational games, or interactive approaches, can increase student interest and make the learning process more enjoyable [12], [13]. Thus, creating a supportive and motivating learning environment, as well as providing appropriate encouragement and recognition, can help students reach their maximum potential in academics.

Learning chemistry is a complex and integral process in education, which not only focuses on theoretical understanding but also on the practical application of chemical concepts in everyday life [14]. In chemistry classes, students learn about the various materials, reactions, and mechanisms underlying natural phenomena, from atomic structure to interactions between molecules [15], [16]. The use of laboratory experiments and practical work is an important part of chemistry learning, allowing students to directly observe chemical reactions and understand basic principles through hands-on experiences . In addition, interactive and collaborative learning approaches, such as group discussions, research projects, and the use of digital technology, can improve students' understanding of complex and abstract material [17], [18]. This approach not only makes learning chemistry more interesting, but also helps students develop critical and analytical thinking skills, which are essential in solving problems [19], [20]. Thus, effective chemistry learning must combine theory and practice, utilize a variety of teaching methods, and encourage active student involvement to achieve a deep and applicable understanding of chemistry.

This research study was carried out to overcome the low motivation of students in studying chemistry subjects, a problem which is manifested in various symptoms at Public High School 6 South Bengkulu. Based on researchers' observations, these symptoms include several aspects that are signs of low student motivation to learn. First, some students were seen playing around and talking with their friends during the teaching and learning process [21], [22]. Second, some students appear to frequently go in and out of class during the learning process. Third, there are students who seem lazy in taking chemistry lessons. Fourth, some students show a lack of motivation in understanding and studying chemistry subjects. To overcome this or anticipate the lack of student motivation at Public High School 6 South Bengkulu, the author wants to try implementing inquiry strategies in the learning process. The inquiry approach means a series of learning activities that maximally involve all students' abilities to search and investigate systematically, critically, logically, analytically so that they can formulate their own findings with full confidence.

This method allows students to be directly involved in the process of discovering concepts and understanding chemical material through investigative and reasoning activities, which is different from the more passive traditional approach. Therefore, this research introduces a new way of teaching chemistry that can encourage students to become more curious and independent in learning [16]. The implication of this research is a significant increase in student learning motivation [23]. By using the inquiry method, students are invited to be more deeply and actively involved in the learning process, which can increase their sense of responsibility and interest in chemistry [24]. In addition, this approach can help students develop critical thinking, analytical skills, and the ability to solve problems independently, all of which are important competencies in chemistry learning and education in general [25]. Based on the explanation above, this research aims to describe increasing student learning motivation using the inquiry method in chemistry subjects in class X Public High School 6 South Bengkulu.

2. RESEARCH METHOD

2.1 Type of Research

This type of research is classroom action research. This research is classroom action research, where this approach is used to identify and solve problems that arise in the classroom environment. By implementing an action cycle involving planning, implementing, observing, and reflecting, classroom action research aims to improve teaching practices and student learning outcomes [30]. This approach allows teachers to play an active role in their own professional development through systematic data collection and analysis of the effectiveness of implemented strategies.

2.2 Population and Sample

In this research, the subjects were class X C students at Public High School 6 South Bengkulu, totaling 41 students. This is because the learning motivation of students at this school, especially class X Public High School 6 South Bengkulu, is still relatively low. This research aims to identify factors that influence low learning

motivation. The object of this research is the application of inquiry methods in learning. It is hoped that this method can increase student motivation and learning outcomes.

2.3 Data Collection Technique

The type of data obtained from this research is qualitative data. This data was collected using observation and documentation techniques. In the observation technique, student learning motivation can be seen from the results of student learning tests increasing and achieving the motivation indicators that have been determined in this research. The learning outcomes tests that were held before and after using this method were each taken by giving questions to students. The achievement of motivation indicators can be seen from the results of observations carried out after and before the research. In this technique, data is obtained by directly observing the learning process using the inquiry method and then filling in the observation sheet provided. In the documentation technique, data is obtained from a collection of students' chemistry scores obtained from student test results in the chemistry teacher's notes before conducting research.

2.4 Data Analysis Technique

Observation data contained in the student activity observation sheet that has been created, the data is added up and analyzed for achievement motivational indicators that have been determined constitute success in action or use of an inquiry approach in the class.

2.5 Research Procedure

This classroom action research procedure begins with the planning stage, where the researcher together with the chemistry teacher prepares a learning plan using the inquiry method which includes objectives, materials, activities and evaluation instruments. Research is carried out in cycles consisting of four stages: planning, action, observation, and reflection. In the action stage, the inquiry method is applied in chemistry learning in class X Senior High School. Students are invited to actively participate in exploration, experimentation and discussion activities to discover chemical concepts independently. During implementation, researchers and teachers observed students' interactions and learning motivation, and collected data through questionnaires and interviews. After each cycle, the results of observations and data are collected in the reflection stage to identify successes and obstacles, which are then used to refine the action plan for the next cycle. This research continues until a significant increase in student learning motivation is achieved.

3. RESULTS AND DISCUSSION

The implementation of cycle I is still not optimal, we can see this from the activities of teachers and students in the learning process. Students in general have experienced changes in learning, they are more active, happy and enthusiastic in learning or in other words, students' learning motivation has increased compared to previous learning which applied learning before action. However, in this cycle, students' learning motivation has not reached the minimum target targeted by the author. The 6 indicators that the author determined, it turns out that 1 indicator reached the target (70%), namely with a score of 79.49, while the other 3 indicators were of medium value, namely with scores of 69.23, 65.81 and 67.52 and the other 2 indicators were of low value with scores of 52.99 and 54.70. Meanwhile, the achievement of all students was 16.67 %. Apart from that, teachers still rarely carry out or fulfill the predetermined indicators which are a reflection of the suitability of the use of inquiry strategies in learning with their planning, with a total score of 28.

In general, the implementation of cycle II was good, we can see this from the activities of teachers and students in the learning process. Students in general have experienced changes in learning, they are more active, happy and enthusiastic in learning or in other words, students' learning motivation has increased compared to the previous learning, namely suklus I. However, in this cycle, students' learning motivation has not reached the minimum target. targeted by the author. Of the 6 indicators that the author set, it turns out that 6 indicators reached the target (70%), namely with scores of 93.16, 75.21, 76.07, 77.78, 79.49 and 72.67. Meanwhile, individual student achievement is medium and high and the achievement of all students is 100%.

The discussion of data regarding student learning motivation in chemistry learning using the inquiry method is observation data conducted on 39 students with 6 indicators, namely: students pay attention to the teacher's explanations well, students are enthusiastic about doing the tasks given by the teacher, students are active in asking and answering in the learning process, students are happy and calm when the learning process takes place, students do not disturb their friends in learning and students feel the need for the lessons given by the teacher.

At the first meeting, the results of observation of indicator I (first) were carried out by 39 students with a percentage of 64%, categorized in the medium/good/minimal group. At the first meeting, the results of observation of indicator II (second) were carried out by 39 students with a percentage of 42%, categorized in the low/poor group. At the first meeting, the results of observations on indicator III (third) were carried out by 39

students with a percentage of 43%, categorized in the low/poor group. At the first meeting, the results of observation of indicator IV (fourth) were carried out by 39 students with a percentage of 66%, categorized in the moderate/good/minimal group. At the first meeting, the results of observation of indicator V (fifth) were carried out by 39 students with a percentage of 67%, categorized in the medium/good/minimal group. At the first meeting, the results of observation of indicator II (second) were carried out by 39 students with a percentage of 41%, categorized in the low/poor group. 54% of the observation results were categorized as having low/poor motivation. For more details, the following graph shows the percentage of learning motivation indicators before action:

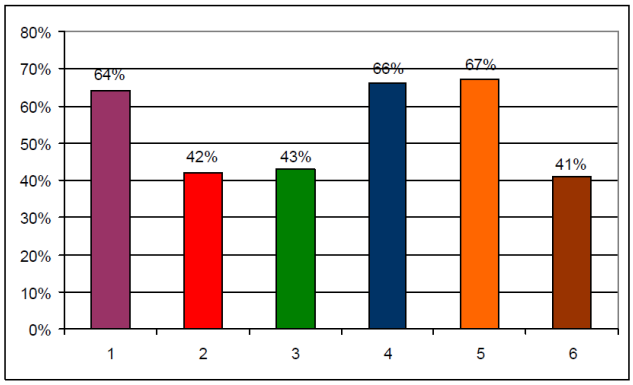

Figure 1. Percentage Graph of Learning Motivation Indicators Before Action

Then in Cycle I the data discussed was observation data made on 39 students. At the third meeting, the results of observation of indicator I (first) were carried out by 39 students with a percentage of 79%, categorized in the medium/good/minimal group. At the third meeting, the results of observation of indicator II (second) were carried out by 39 students with a percentage of 69%, categorized in the low/poor group. At the third meeting, the results of observations on indicator III (third) were carried out by 39 students with a percentage of 53%, categorized in the low/poor group. At the third meeting, the results of observation of indicator IV (fourth) were carried out by 39 students with a percentage of 66%, categorized in the moderate/good/minimal group. At the third meeting, the results of observation of indicator V (Fifth) were carried out by 39 students with a percentage of 68%, categorized in the medium/good/minimal group. At the third meeting, the results of observations on indicator VI (sixth) were carried out by 39 students with a percentage of 55%, categorized in the low/poor group. So the observation results were 64.96 % categorized as having moderate/good motivation, but minimal.

For greater clarity, below is shown in Figure 2, a graph of the percentage of learning motivation indicators in cycle I:

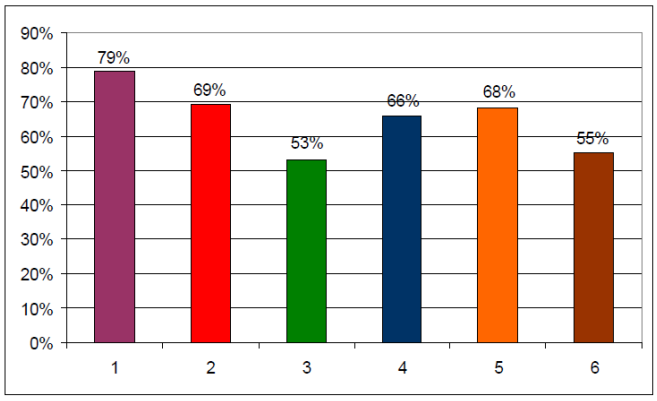

Figure 2. Percentage Graph of Learning Motivation Indicators in Cycle I

Then in Cycle II the data discussed was observation data made on 39 students. At the first meeting, the results of observation of indicator I (first) were carried out by 39 students with a percentage of 93%, categorized in the high/very good/optimal group. At the first meeting, the results of observation of indicator II (second) were carried out by 39 students with a percentage of 75%, categorized in the high/very good/optimal group. At the first meeting, the results of observation for indicator III (third) were carried out by 39 students with a percentage of 76%, categorized as high/very good/optimal. At the first meeting, the results of observation of indicator IV (fourth) were carried out by 39 students with a percentage of 78%, categorized in the high/very good/optimal group. At the first meeting, the results of observation of indicator V (fifth) were carried out by 39 students with a percentage of 79%, categorized in the high/very good/optimal group. At the first meeting, the results of observation of indicator VI (sixth) were carried out by 39 students with a percentage of 73%, categorized in the

high/very good/optimal group. So 79% of the observation results were categorized as having high/very good/optimal motivation. For more details, the following graph shows the percentage of motivation indicators in cycle II.

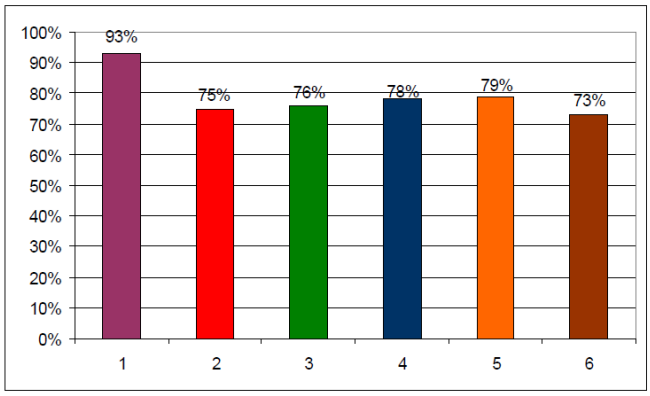

Figure 3. Percentage Graph of Learning Motivation Indicators in Cycle II

Looking at the results of observations regarding the chemistry learning motivation of students at Public High School 6 South Bengkulu in the second cycle, it was categorized as very good/optimal (already optimal). This means that students' learning motivation has increased well between before the action, cycle I and cycle II. For more details, see Figure 4. Based on Figure 4, it can be seen that there was an increase in student learning motivation from before the action to cycle I, then from cycle I to cycle II. Even though it is so high, teachers still continue to try to increase students' learning motivation.

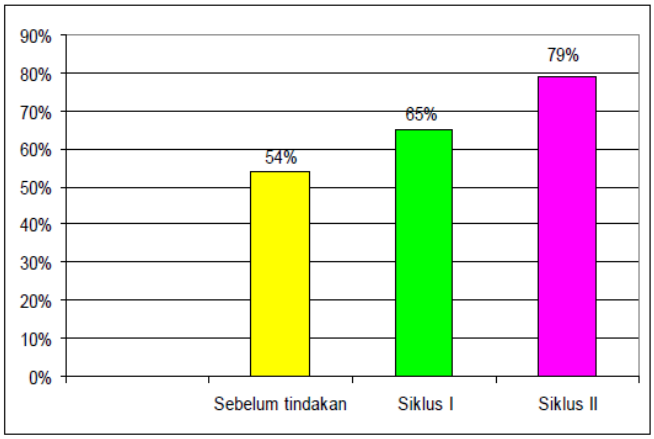

Figure 4. Graph of Recapitulation of Percentage of Student Learning Motivation Before Action, Cycle I and Cycle II

Based on the information above, it is clear that the application of the inquiry method in chemistry learning to increase student learning motivation at Public High School 6 South Bengkulu is classified as very good or optimal. Because it is already in the range of 76%-100%. This is in accordance with the indicators achieved, namely 76%-100% which is classified as very good, this means that the application of the inquiry method at Public High School 6 South Bengkulu can increase student learning motivation.

The implications of this research include increasing students' learning motivation in understanding chemical concepts through their own exploration and discovery. By using the inquiry method, it is hoped that students will become more involved in the learning process, build critical thinking skills, and be able to relate chemical concepts to real world contexts, thereby increasing better understanding. However, there are several limitations that need to be considered in applying the inquiry method to chemistry learning. One of them is the need for student readiness to follow a more independent and active learning approach. Apart from that, the role of teachers in supporting and guiding the inquiry process is also very important, so training and improving teacher skills are needed in implementing this method effectively.

However, there are several limitations in this research that need to be noted. One of the main limitations is the need for more time to implement inquiry methods compared to traditional teaching methods, which may not always be available in a busy learning schedule [26]. In addition, this method requires teacher readiness and skills in managing the class and facilitating the inquiry process, which can be a challenge if the teacher is not used to this approach [27]. The varied involvement of students in inquiry activities can also be an obstacle, where students who are less active or less confident may need additional support to be able to participate

effectively. In addition, inquiry learning is designed to invite students directly into the scientific process in a relatively short time [28]. Inquiry training can improve understanding of science, be productive in thinking and make students skilled in obtaining and analyzing information [29]. The above success in increasing understanding is due to the increase in students' learning motivation which encourages them to play an active role because they feel involved in learning.

4. CONCLUSION

Based on the results of research and data analysis, it was concluded that there was an increase in the chemistry learning motivation of class X students at Public High School 6 South Bengkulu the application of active learning strategies with inquiry strategies has increased compared to before, this can be seen from students' achievements. Based on the findings of this research, it is recommended that chemistry teachers actively adopt and integrate inquiry methods in their lesson plans to increase students' learning motivation. The inquiry method, which encourages students to ask, explore and discover chemical concepts independently, can create a more interactive and interesting learning environment. Teachers need to be given adequate training regarding the implementation of inquiry methods to ensure their effectiveness. In addition, schools must provide the necessary resources and support, including sufficient time in the curriculum for full implementation of these methods. Further research is also recommended to explore the variations in inquiry methods that are most effective in different contexts and their long-term impact on student motivation and achievement.

ACKNOWLEDGEMENTS

The researcher would like to express his deepest gratitude to all parties who have assisted in this research.

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