

## PROBLEMATIC ANALYSIS OF SCIENCE LEARNING PROCESS

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**Abstract:** This study aims to thoroughly analyze the problems encountered in the Natural Science (IPA) learning process at SMP Negeri 1 Suwawa Timur, considering the 21st-century curriculum demands that require the development of students' scientific attitudes and skills through direct experience. This research employs a descriptive qualitative approach, where data was collected through a closed questionnaire administered to 32 students of class IX A and in-depth interviews with the IPA subject teacher. The analysis results identified two major interconnected issues: (1) lack of teacher competence and strategies, and (2) sub-optimal utilization of school facilities and infrastructure. The low student learning motivation was confirmed by the teacher as a crucial obstacle, which ironically occurs despite the school having complete laboratory facilities. The root problem was found in the lack of teacher knowledge and professional competence in operating and utilizing laboratory equipment for practical activities. It is concluded that the minimal implementation of practical work due to limitations in teacher competence is the main factor contributing to low student motivation and learning achievement. Therefore, this study recommends the necessity of continuously enhancing teacher competence related to laboratory facility utilization to optimize the quality of the IPA learning process in the school.

**Keywords:** Learning Problems, Science Learning Process

### 1. INTRODUCTION

Education is a series of essential stages that must be passed by students to achieve balance and develop their superior potential, both in affective, cognitive, and psychomotor aspects. One of the main indicators in assessing the quality of education is how the learning process is carried out (Muliawan et al. 2022). Quality learning will have a direct impact on improving the quality of education as a whole. Therefore, efforts to improve the quality of learning are very important to realize quality education. It is impossible for quality education to be achieved without first creating an effective and quality learning process (Haka et al. 2020). The quality of learning itself is influenced by various important factors that are interrelated, which can generally be distinguished into internal factors and external factors (Suhendra, 2020).

In essence, learning is the process of regulating and organizing the learning environment to encourage students to actively learn. Learning also includes providing guidance by teachers to help students overcome differences in ability to understand the material. Since learning means "change", learning can be considered as an "arrangement"

of the process. The learning process is characterized by planned educational interaction between teachers and students through the design, implementation, and evaluation stages. It is this effective interaction that results in optimal learning (Pane et al. 2017).

Science is a field of science that focuses on the observation and analysis of natural objects and phenomena through scientific investigation methods, which then produce various products such as facts, concepts, principles, laws, and theories (Salsabil et al. 2024). In addition, science is a systematic process for formulating, developing, and compiling knowledge about natural events (Nasution et al. 2024). Supported by Noviyanto et al. (2021), it is stated that curiosity is an attitude and action to know in detail what is not yet known, becoming the initial capital of students in undergoing the scientific learning process. This drive of curiosity encourages learners to investigate and understand scientific phenomena consistently and systematically.

The essence of science learning lies in its ability to develop students' thinking through four main components. First, the attitude aspect, namely the emergence of curiosity about objects, natural phenomena, living things, and cause-effect relationships that can cause new problems and are open to further exploration. Second, the process aspect, which includes scientific steps in problem solving, such as formulating conjectures (hypotheses), designing and carrying out experiments, conducting evaluations and measurements, and concluding results. Third, the product aspect, which includes scientific results in the form of facts, principles, theories, and laws. Fourth, the application aspect, namely the ability to use scientific methods and science concepts in daily life (Indrawati, 2018; Jufrida et al. 2020).

In practice, the science learning process at SMP Negeri 1 Suwawa Timur still faces various problems that have the potential to hinder the achievement of 21st century learning goals. Therefore, analysis of science learning problems is important to identify the factors that cause low learning effectiveness, such as student motivation, teacher competence, and the use of infrastructure, in order to formulate solutions that can improve the quality of learning as a whole.

## **2. RESEARCH METHODS**

This research was conducted at SMP Negeri 1 East Suwawa, which is located in Tilangobula Village, East Suwawa District, Bone Bolango Regency, Gorontalo Province.

The population of this study is all grade IX students at SMP Negeri 1 East Suwawa. The sample of this study is 32 students of class IX A.

This study uses a qualitative descriptive method. The data collection instrument uses a questionnaire in the form of a questionnaire that aims to find out the problems faced by students when learning science. This questionnaire has 6 indicators, namely teacher competence and strategy, student motivation and student attitude, learning facilities and infrastructure, learning methods and models, learning environment and learning evaluation. This questionnaire is closed (closed questionnaire) with a checklist format. The measurement scale used is a 4-level Likert Scale, namely: 1) excellent; 2) good; 3) sufficient and; 4) Low.

This study also uses interview instruments that aim to find out more about the problems faced during the science teaching process at SMP Negeri 1 Suwawa Timur. The data analysis technique used is interactive model analysis, which consists of three stages, namely data reduction, data presentation, and conclusion drawn.

### 3. RESULTS AND DISCUSSIONS

The problems of the science learning process at SMP Negeri 1 Suwawa Timur were analyzed by giving a questionnaire to 32 students of class XI A shown in Figure 1.

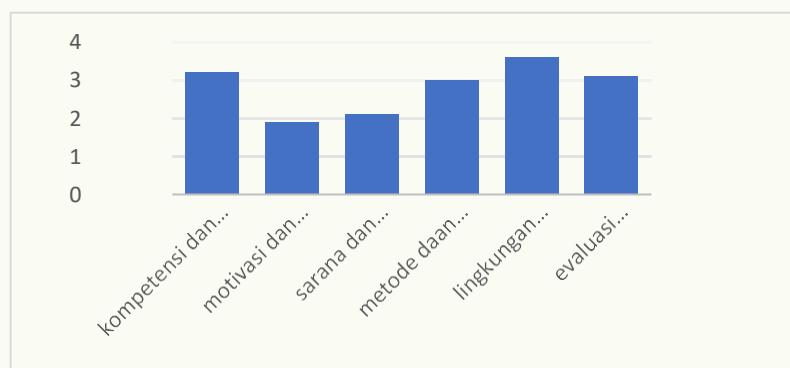


Figure 1. Graph of Student Questionnaire Results

Based on the graph of the results of the student questionnaire (Figure 1), it was found that the main problem in the science learning process was the motivation and attitude of students who were in the low category. In addition, learning facilities and infrastructure are also rated low by students.

These findings are in line with the results of interviews conducted with science teachers. The teacher confirmed that the main obstacle that often arises is the lack of pedagogic competence of teachers and strategies resulting in a lack of motivation to learn

from students. This is in line with Abdul Rachman Tiro, et al (2014) that teachers' pedagogic competence affects students' motivation. This has an impact on the lack of involvement of students in developing scientific thinking skills and solving problems. Regarding facilities and infrastructure, the informant revealed that the laboratory facilities are actually complete. However, its use is not optimal and is rarely used. The teacher stated that this happened due to a lack of knowledge to use these tools, although it was realized that the use of these tools could help students visualize abstract concepts.

This study aims to analyze the problems faced in the science learning process at SMP Negeri 1 Suwawa Timur. Based on the results of the research obtained from student questionnaires and teacher interviews, two main problems were identified that are interrelated, namely (1) low motivation and attitude of students, and (2) the use of facilities and infrastructure has not been optimal.

The first and most significant finding is the low motivation and attitude of students towards science learning. The questionnaire data showing a low category in this aspect is reinforced by the statement of teachers who consider it a major obstacle. This problem is crucial because motivation is the main internal driver for students to learn. Without adequate motivation, the demands of 21st century education that expects students to actively build knowledge independently become difficult to achieve. The results of the interviews also confirmed the direct impact of this low motivation, namely the lack of involvement of students in developing scientific thinking process skills and solving problems. In fact, science learning ideally requires creativity and high motivation to achieve mastery of scientific skills and attitudes.

The second main problem is related to facilities and infrastructure. The findings from the interviews provide more in-depth clarification than the questionnaire data. Although the students perceive the infrastructure as "low", the teacher clarifies that the core facilities such as the laboratory are actually complete. The real problem does not lie in availability, but in the use that is not yet optimal.

The teacher admitted that the facility was rarely used because of the obstacle in the form of a lack of knowledge of teachers in operating laboratory equipment. This is a significant gap, because the essence of science is a science that focuses on the observation and investigation of natural phenomena. Scientific processes such as designing experiments and taking measurements are at the heart of science learning. When the

laboratory is not functioning as it should, science learning runs the risk of becoming too theoretical, abstract, and only focused on memorizing concepts, far from the essence of science as a process of discovery.

These two problems are suspected to strongly influence each other. Teachers themselves realize that the use of facilities can increase students' interest and help visualize abstract concepts. It can be concluded that learning that rarely uses practicum or demonstration contributes to low motivation and interest in students. On the other hand, students who are not motivated make teachers less reluctant to carry out more complex learning such as practicums.

These findings are in contrast to previous studies at the same location by Halubangga et al. (2024), which showed that the application of innovative models such as Problem Based Learning (PBL) to Newton's Law material has proven to be very effective in improving student learning outcomes (N-Gain in the high category of 0.77). This is also in line with Tiurlina Siregar, the success of the study indicates that students at SMP Negeri 1 Suwawa Timur actually have potential and respond well when faced with active and contextual learning methods. However, the findings of this study, especially related to low motivation and the lack of use of laboratories due to the limited knowledge of teachers, indicate that these innovative learning practices may not have been implemented consistently or evenly in the daily science learning process in the school.

## **4. CONCLUSIONS AND SUGGESTIONS**

### **CONCLUSIONS**

The problems found in this study are the lack of competence and strategies of learning methods by teachers, facilities and infrastructure, and learning evaluation resulting in a lack of motivation and attitude of participants in science learning.

### **SUGGESTIONS**

It is necessary to improve the ability of teachers to pay attention to facilities and infrastructure at SMP Negeri 1 Suwawa Timur in order to increase the motivation and attitude of students in science subjects.

## 5. ACKNOWLEDGMENTS

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