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# Analysis of Student Learning Difficulties at MA AL-Kautsar Pekanbaru in Physics Subjects in the Kinematics of Rectilinear Motion Material

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**A B S T R A C T**

This research aims to identify the level of learning difficulties faced by students in physics at a private school in Pekanbaru. The research subjects consist of students from class IX MIPA of the science department. The method used is a descriptive qualitative approach, where data is collected through questionnaires distributed to the students. The research results show that the learning difficulties experienced by the students are influenced by internal factors, such as students' intelligence and motivation. These factors lead students to perceive physics learning as difficult, and they struggle to understand the material presented by the teacher and apply it to problems. Therefore, strategies are needed to improve students' understanding of physics learning at MA AL Kautsar Pekanbaru.

## 1. Introduction

The low quality of education across various levels and types in Indonesia is one of the primary challenges that must be addressed in today's modern era. To overcome this issue, the government has undertaken numerous efforts, such as improving the quality of education, enhancing teacher competencies, adapting curricula, and implementing other measures. Enhancing educational quality is a crucial indicator that must be achieved to ensure that learning objectives can be optimally realized in alignment with governmental initiatives. This aligns with the demands of the 2013 Curriculum, which aims to produce a productive, creative, innovative, and character-driven generation. Therefore, studies on learning remain vital amidst current developments (Patilima, 2022).

Physics is a discipline that examines natural phenomena or occurrences in the surrounding environment. Effective physics education is carried out by facilitating students to directly observe the phenomena taking place. However, not all phenomena can be observed directly; thus, supporting tools are required to resolve the problems at hand, making the concepts easier for students to understand. Physics learning addresses events encountered in daily life through experimentation and observation activities rooted in scientific attitudes to enhance students' science process skills (Mutiara Mukti et al., 2020).

Field observations at SMA Negeri 5 Ambon reveal that students face difficulties in learning physics. This is evident from the varying learning outcomes and capabilities among students. Hamalik (1990) states that when students experience failure or regression in learning outcomes, it indicates difficulties encountered during the learning process. Students' learning difficulties can also be detected through low achievement levels or results that do not meet expectations. Often, teachers may not fully understand all the difficulties students face. However, identifying these challenges allows teachers to devise appropriate solutions or alternative approaches to address these issues, particularly in science and physics learning. Additionally, to address learning difficulties, teachers can adopt varied methods or teaching approaches that align with the topic being taught, thereby fostering students' analytical and critical thinking skills (Salmawati, 2022).

The use of experimental tools in physics education plays a pivotal role in generating student interest and making learning processes more meaningful. The goal is for students to understand concepts concretely (Muna, 2017). Although experimental tools are widely available on the market, many are still manually operated (Siregar, 2019). The limitations of such tools include experimental data often being inconsistent with theoretical predictions, lengthy data processing to verify experimental validity, and inefficiencies in time usage (Fauza et al., 2022). One area of physics that requires special attention regarding its experimental tools is kinematics, specifically linear motion (Majid, 2016). Experiments in linear motion often yield incorrect data, leading to misconceptions among students ( Nasir, 2023). Moreover, the assembly and operation of experimental tools consume significant time (Shihab, 2021).

Experiments are a teaching method that provides opportunities for students to engage directly and simultaneously develop intellectual, motor, and emotional skills through the use of laboratory tools (Fauza, Syaflita, Ernidawati, et al., 2022).
Observations in the IX MIPA class indicate that students struggle with physics lessons, finding the material difficult to understand. They perceive physics as a challenging subject due to numerous formulas, difficulties in solving problems, and a lack of interest in the subject matter. Teachers must investigate the reasons behind students' perceptions of physics. During observations, the learning environment appeared relatively conducive, yet some students seemed indifferent during physics lessons. This indicates barriers or issues that hinder students, causing them difficulties in learning physics. These difficulties obstruct the

systematic learning objectives designed by teachers and prevent students from experiencing optimal enjoyment and learning in physics.

Not all problems faced by students are fully understood by teachers. However, recognizing these challenges enables teachers to develop appropriate solutions or alternatives to address them, especially in physics lessons. Teachers can use varied teaching methods or approaches aligned with the material being taught to encourage students' analytical and critical thinking skills.

The United States Office of Education (USOE) defines learning difficulties as disturbances in one or more processes of self-understanding, including comprehension and the use of explicit and implicit language (Defriyanto & Dermawan, 2018). According to Haqiqi (2018), learning difficulties arise when students are unable to learn effectively due to specific obstacles or disruptions during the learning process, preventing them from achieving desired outcomes. (Gupita & Minsih 2020) explain that learning difficulties refer to factors causing failure or disruptions in students' learning processes.

The factors contributing to students' learning difficulties can be categorized as internal or external (Melinia, 2019). Internal factors include low intellectual capacity, nervous system issues, emotional instability, lack of interest and motivation, and sensory impairments. External factors include unsupportive family and community environments and inadequate educational institutions. Students experiencing learning difficulties are unable to meet the expected learning achievement indicators due to obstacles preventing optimal learning outcomes. Arifin (2012) and Amaliyah et al. (2021) identified indicators of learning difficulties among students, such as:

a. Requiring longer time to understand lesson materials.
b. Poor physics grades causing disinterest in subsequent lessons.
c. Inability to answer teachers' questions or complete assignments.
d. Differences in learning outcomes among group members.
e. Influence of teaching models on students' learning outcomes.
f. Insufficient capacity to meet academic standards.
g. Poor behavior, lack of motivation, politeness, or adaptability.
h. Difficulty completing assigned tasks, slowing learning progress.

Additionally, students' interest in physics significantly impacts their learning difficulties. Irvani (2019) found a positive correlation between students' interest in physics and their learning outcomes; lower interest results in poorer performance. Most students have difficulty applying physics to real-life situations. The reason why physics is difficult for students is because physics learning is less meaningful and less innovative. Students are not given enough opportunities to rediscover, find out and construct their own physics ideas so that children quickly forget about physics concepts and cannot apply them in everyday life (Cahyono, 2019). In the learning process, the development of an atmosphere of equality through transparent, tolerant, and non-arrogant dialogical communication should be realized in learning activities. In this case, the role of teachers in learning

activities is very complex. Teachers do not just convey knowledge to their students, but teachers are guided to play various roles that aim to develop the potential of their students optimally. So teachers must be able to create an atmosphere that provides ample opportunity for students to dialogue and question various things related to self-development and their potential. In addition, teachers as facilitators are tasked/play a role in guiding and directing students who experience difficulties (Warliani, 2022)

In conclusion, students' learning difficulties are influenced by internal and external factors that require attention to ensure learning objectives are met. This study aims to identify the learning difficulties experienced by students regarding linear motion kinematics in Class XI MA AL Kautsar Pekanbaru.

## 2. Methodology

The method used in this research is descriptive with a qualitative approach. This study is a case study conducted at one of the Islamic Senior High Schools (MA) in Pekanbaru City. The purpose of this case study is not to develop theory but to serve as a foundation for future research (Prihatsanti et al., 2018). The research subjects consisted of 25 students from class XI Science Stream B at MA AL Kautsar Pekanbaru.

To collect data, the researcher employed a questionnaire technique to identify learning difficulties. The type of questionnaire used in this research is a closed-ended questionnaire, providing answer choices with a scoring range from 1 to 4. These answer choices are presented in the form of a Likert scale, as shown in Table 1.

Table 1. Likert Scale Categories

| Statement | Score |
|---|---|
| Don't Agree | 1 |
| Disagree | 2 |
| Agree | 3 |
| Strongly Agree | 4 |

Source: (Riduwan, 2007)

The questionnaire was distributed to the students by handing out the questionnaire sheets in the classroom designated as respondents. The analysis of the questionnaire in this research employed a descriptive quantitative approach using the percentage formula, as follows:

$$P = \frac{f}{n} \times 100\%$$

Information :
P = Percentage (%)
f = Frequencyy of each questiommaire answer
n = Number of Respondents

After calculating the percentages, the data obtained were tabulated into the criteria used to draw conclusions, as presented in Table 2.

Table 2. Learning Difficulty Criteria

| Statement | Sultanate Category |
|---|---|
| 0% - 20% | Very Low |
| 21% - 40% | Low |
| 41% - 60% | Fair |
| 61% - 80% | High |
| 81% - 100% | Very High |

Source: Mastika, et al (2014)

## 3. Results and Discussion

The results of the research from the distribution of questionnaires with indicators of students' learning difficulties in physics are presented in Table 3.

Table 3. Results of Responses to Student Learning Difficulties on Kinematics of Straight Motion Material

| No | Indicator | Answer | | | |
|---|---|---|---|---|---|
| | | SS | S | TS | STS |
| 1 | If my physics score is low, I don't want to study physics | 0% | 0% | 24% | 76% |
| 2 | I did not complete the assignment on time | 20% | 60% | 20% | 0% |
| 3 | I find it difficult to understand the concept of straight motion kinematics that is explained | 8% | 60% | 32% | 0% |
| 4 | I find it difficult to answer questions given by the teacher | 40% | 52% | 8% | 0% |
| 5 | I feel unmotivated when I don't use experimental tools during learning | 56% | 36% | 8% | 0% |
| 6 | I ask questions that are not understood | 16% | 48% | 36% | 0% |
| 7 | Learning uses demonstration | 0% | 8% | 52% | 40% |
| 8 | I have difficulty understanding the example questions given by the teacher | 12% | 44% | 40% | 4% |

Based on the research results, eight indicators were assessed. Therefore, the overall percentage results for these indicators were calculated and are presented in Table 4.

Table 4. Percentage Results of All Indicators of Student Learning Difficulties in Physics Subjects at MA AL Kautsar

| No | Indicator | Percentage | Category |
|---|---|---|---|
| 1 | Low Value | 31% | Low |
| 2 | Difficulty doing assignments | 75% | Tall |
| 3 | Difficult to Understand | 69% | Tall |
| 4 | Answering Questions | 83% | Very High |
| 5 | Have motivation | 87% | Very High |
| 6 | Ask Questions | 70% | Tall |
| 7 | Less Activity | 60% | Enough |
| 8 | Observing Examples | 66% | Tall |

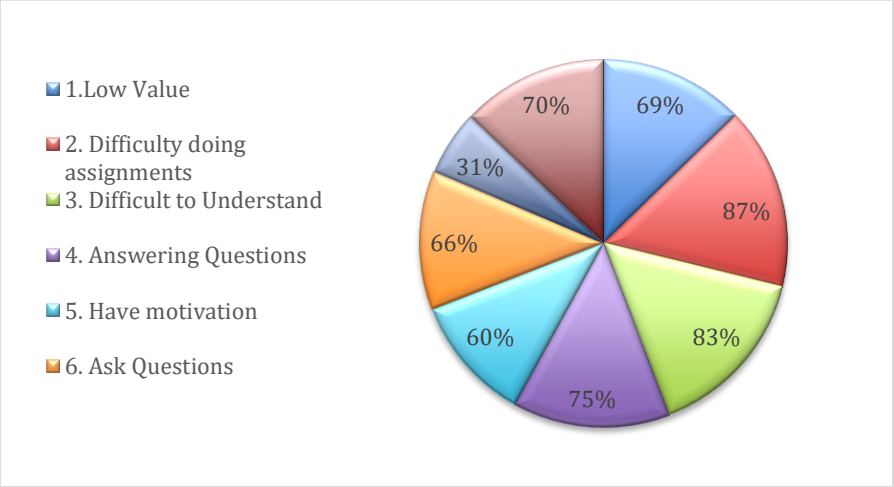


Figure 1. Diagram of Indicator Results to Help Student Learning

Based on research data directly related to students' internal factors, it was found that certain indicators, categorized as high, demonstrate difficulties in physics subjects. The most dominant indicator is the difficulty in understanding the material, with a percentage of 69% categorized as high. This is due to a lack of student motivation in learning physics, limited curiosity about the material delivered by the teacher, and students' indifference during lessons (Suryani et al., 2021).

Furthermore, research data related to students' external factors revealed two indicators categorized as very high in experiencing learning difficulties in physics. The dominant indicators are the inability to answer when the teacher asks questions and a dislike of learning through demonstration methods, with percentages of 83% and 87%, respectively, categorized as very high. These difficulties stem from a lack of motivation from peers, an unsupportive family environment, and ineffective presentation and delivery methods by the teacher.

Martini (2014) states that students face several challenges, including difficulties in understanding the material taught, completing assignments, and comprehending textbook content. In this study, the researcher identified eight types of difficulties students face in learning physics, particularly in the topic of linear motion kinematics. These include difficulties in mastering concepts, connecting relationships between concepts, understanding formulas, and applying formulas to solve problems.

The difficulty in mastering concepts (69%) is higher compared to students who do not face such challenges. The high percentage of students struggling to master the taught concepts indicates that physics learning, especially on the topic of linear motion kinematics, is not well understood. Therefore, strategies are needed to address these difficulties. Many learning models can be employed to enhance students' understanding. For instance, (Siti Nurhaliza 2024) demonstrated that cooperative learning using spinning question media effectively improves cognitive learning outcomes in middle school students. According to (Fakhriyah

2014), developing critical thinking skills should not only be integrated into learning activities but also supported by assessment instruments that reflect these skills. However, the reality shows that the percentage of critical thinking-based questions remains low.

The second learning difficulty is students' inability to complete tasks according to the concepts taught, with a percentage of 75%. This finding highlights that students increasingly struggle with learning, particularly in linear motion kinematics concepts. When linked to the first difficulty mastering concepts these results reveal a correlation: students who fail to master concepts are also likely to struggle in completing assigned tasks. In other words, students cannot establish relationships between concepts if they have not fully understood and mastered the concepts themselves.

To connect relationships between concepts, students must not merely memorize the concepts of linear motion kinematics but must have a deep understanding and mastery of them. Once a concept is well-understood and mastered, it becomes easier for students to establish connections between those concepts.
In physics, natural phenomena are often represented and explained using mathematical symbols and formulas. Therefore, mastering physics concepts also requires an understanding of basic mathematical concepts (Wijaya et al., 2012). Meltzer (2002) states that there is a positive correlation between mathematical mastery and success in achieving physics learning outcomes, while Rusilowati (2006) reports that one of the causes of students' difficulties in learning physics is weak mathematical abilities. With low mathematical skills, students are increasingly unable to articulate the formulas they learn.

## 4. Conclusion

Based on the research findings and discussions regarding students' learning difficulties in physics, it can be concluded that students indeed experience learning challenges. This is indicated by the high percentage of the indicator "difficulty in understanding linear motion kinematics" and the very high percentage of the indicator "inability to answer when questioned by the teacher," as well as the lack of student interest in demonstration-based learning. The factors influencing students' learning difficulties include internal factors such as students' intrinsic motivation and their indifference during lessons. External factors include an unsupportive peer environment, family environment, and ineffective teaching presentation and delivery methods.

## Confession

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