

Profile of Problem Solving and Student Learning Motivation in Science Learning Material on Motion and Force at SMPN 5 Randublatung Satu Atap

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Abstract: This research aims to determine students' problem-solving abilities and learning motivation on Motion and Force material. The method in this research uses a qualitative descriptive approach with the subjects used being 18 grade 7 students of SMPN 5 Randublatung Satu Atap, totaling 18 people. To measure students' learning motivation and ability to solve problems. The research results show that the level of student motivation in learning movement and style still varies (high, medium and low). As many as 53% of students have a high level of motivation (scores 54-65); as many as 37% of students have a moderate level of motivation (scores 35-53); and as many as 10% of students have a low level of motivation (score 24-34). The ability to solve problems obtained results in the form of the lowest score of 15, the highest of 45, and the average in one class was 38. The research results showed that students did not understand the material of motion and force. This can be seen from the results of the questionnaire data and questions.

Keywords: Cognitive abilities; Learning methods; Motivation and problem solving

Introduction

Education is an important means of developing a nation. The importance of efforts to improve the quality of educational resources is reflected in the Law (National Education System Number 20 of 2003 Article 3) which emphasizes that national education functions to educate the nation by developing abilities & forming the character and civilization of a dignified nation. Education is expected to be able to produce the next generation who can advance the nation in various fields. These efforts are formulated in the objectives of national education, namely the Minister of Education and Culture Regulation Number 23 of 2006 concerning Graduate Competency Standards (SKL) at the junior high school level which states that student graduates are expected to be able to demonstrate the ability to analyze & solve complex problems. Given the nation's increasingly competitive challenges in the future,

problem-solving skills are important for students (Wena, 2014; Cahyani & Setyawati, 2017; Syarif et al., 2019; Asmara & Septiana, 2023; Cheriani et al., 2015; Bayuningsih et al., 2017).

Low problem-solving ability and student motivation in learning can result in low quality of human resources. Therefore, teachers are required to be able to choose the right learning methods and models so that students' problem-solving abilities can be realized. Changes in teaching strategies need to be made so that learning is not centered on the teacher but on the students, so that students tend to be active in finding their own answers or solutions to a problem and applying them in everyday life.

Learning that can be said to be optimal is learning where the teacher does not only explain but students must be more active in finding out and building their own knowledge and the role of the teacher as a facilitator and motivator, this aims to make students more

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independent/skilled and active during learning. To create optimal learning, you must think about approaches and media that are appropriate to the material. The main task of the teacher is to organize learning activities that allow for optimal interaction between students and students or students and teachers or vice versa. However good and ideal education is, however complete the educational facilities and infrastructure are without being balanced with the teacher's ability to implement them, the learning process will be less meaningful. Teachers are given the freedom to utilize various approaches and learning methods that can foster interest, process skills, attention, and student activity so that the learning process becomes more meaningful (Depdiknas, 2006; Nasution, 1998).

Physics learning is taught so that students can understand physics concepts, especially Motion and Force material well so that they can solve problems related to the concepts learned (Arestu et al., 2018; Trianto, 2014; Lestari & Suyono, 2018; Syahrul & Setyarsih, 2015; Syamsidah & Suryani, 2018; Mardhiyah, et al., 2022; Siregar & Harahap, 2020; Marlina et al., 2018; Sherin, 2019; Rusmono, 2012; Rubini & Sunaryo, 2016; Lestari et al., 2022) and can apply them in life (Fitrianingrum et al., 2017) Learning objectives are said to be successful if students can solve Motion and Force problems in everyday life using the physics concepts they understand. If students understand the concept well, they can easily apply the concepts they have obtained to activities in everyday life. In the implementation of the physics learning process, it does not always run smoothly without obstacles. Often what is conveyed by the teacher is not entirely conveyed well so that errors occur in understanding the concept. This is common in the learning process, but it needs to be minimized so that learning success is better.

Pujianto et al. (2013) and Wiyono et al. (2016) stated that there is still an incorrect understanding of the concept in junior high school students in analyzing cases about straight motion. This shows that although the concept of physics has begun to be taught at the basic level, it does not guarantee success in understanding the concept correctly in its entirety. There are still several errors in understanding the concept in learning physics on the material of Motion and Force.

Physics material needs to be studied sequentially because each concept in physics material is interrelated between one concept and another. There are still many students who do not understand the concept of vertical motion and the effect of force on an object. This is what makes mistakes in understanding concepts often occur if students cannot understand one of the concepts correctly. When there is a misunderstanding of a concept, it will continue so that it can affect learning the

concept. This problem certainly needs to be minimized in the learning process so as not to interfere with the process of delivering other materials. Mistakes in understanding concepts can occur because students' abilities in understanding the concepts presented vary. This can happen because from the beginning the input of students' thinking abilities has been different. Likewise with activeness, enthusiasm, motivation and other influencing factors.

In the process of learning physics, encouragement is needed for students to be able to use new knowledge to solve physics problems in various problems (Sutopo et al., 2017; Andriani & Darsikin, 2016; Oglivie, 2009; Nieminen et al., 2010; Amalisholeha et al., 2023; Busyairi & Zuhdi, 2020). If they do not understand the concept, the problems faced will be difficult to solve. Students' understanding of the concept is a benchmark for the success of physics learning (Fitrianingrum et al., 2017; Caleon & Subramaniam, 2010; Eryilmaz, 2010; Kasanah & Setiyawati, 2024; Sholihat et al., 2017).

The purpose of this study is to determine the motivation and problem solving in the material of motion and force in science subjects, especially physics. Educators need to analyze their students' conceptual understanding in understanding physics material in order to avoid misunderstanding of the material that has been studied. Educators need to know if there is a misunderstanding in understanding the concept in the physics material that has been delivered so that a solution can be found, by knowing the misunderstanding it can be used as material in making improvements in learning.

Method

The study was conducted for 2 weeks of 10 lesson hours in September 2023 at SMPN 5 Randublatung Satu Atap, Blora Regency, for class VII students in the odd semester of the 2023/2024 academic year. The subjects of the study were 28 class VII students of State 5 Randublatung Satu Atap with 15 statements of learning motivation and 20 multiple-choice questions on the material Motion and Force.

The type of research used is descriptive qualitative to describe students' conceptual understanding of motion and force material in science subjects. According to Agung (2014), Koyan (2012), Priadana et al. (2021), Harahap (2020), Sugiyono (2009), Abdillah et al. (2022), and Sihotang (2023), the quantitative descriptive analysis method is a method of processing data which is carried out by systematically arranging it in the form of numbers or percentages regarding an object being studied so that a general conclusion is obtained. The subjects in this research were 18 students of SMPN 5

Randublatung Satu Atap. The target in this research is students' understanding of concepts regarding motion and force. The instrument used is test questions, data collection techniques are carried out by observing learning activities and giving multiple choice questions totaling 20 questions where the multiple choice questions represent concepts regarding motion and force. This question presents a question with one correct answer and the other choices are wrong, while the motivation statement contains reasons that must be answered like the existing rubric. With this type of question, in determining the correct answer, students need a good understanding of the concept.

Result and Discussion

Questionnaire data on student motivation in learning movement and style was collected from students at SMP Negeri 5 Randublatung Satu Atap, Blora Regency. This data can be used to determine the level of student motivation in learning movement and force, as well as the factors that influence their motivation. Scientists have developed various theories to explain student learning motivation. One commonly used theory is the Achievement Motivation Theory by David McClelland. This theory classifies student learning motivation into three main categories, with number intervals indicating high, medium and low.

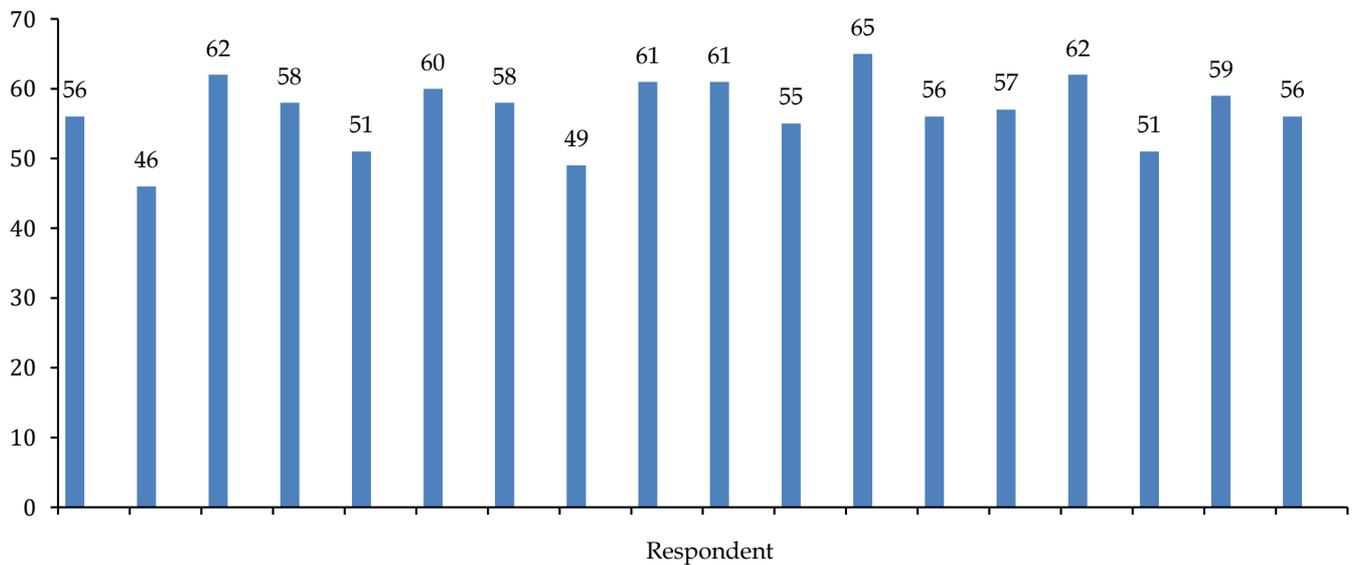


Figure 1. Motivational questionnaire graphic

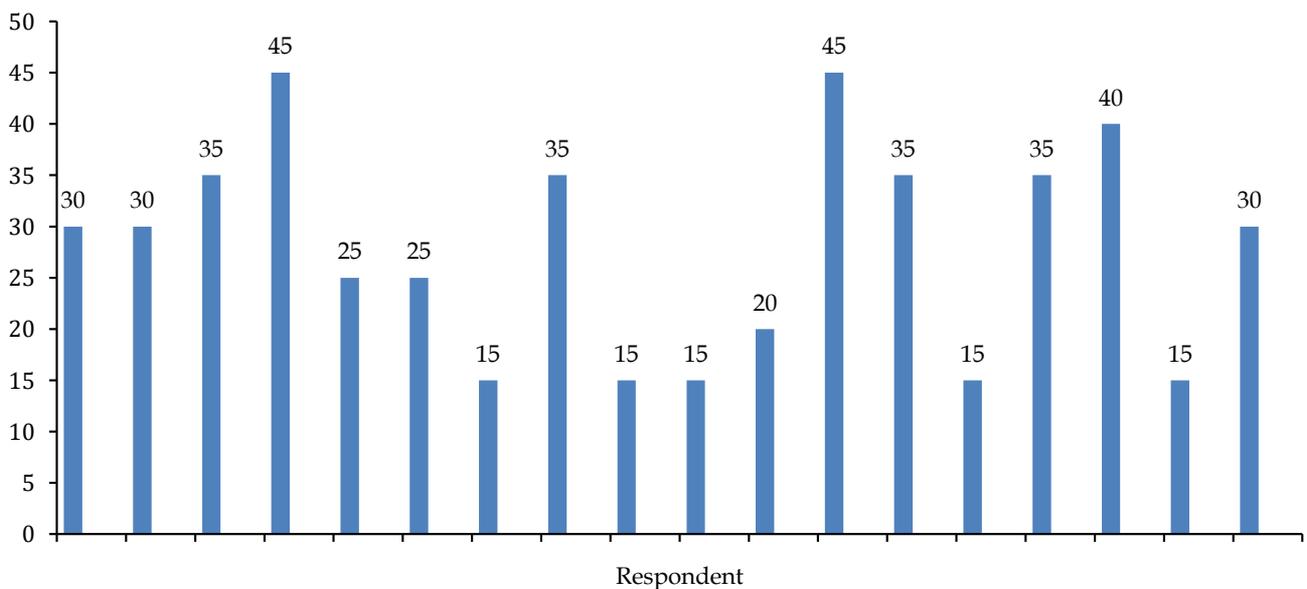


Figure 2. Problem solving value graph

Table 1. Student Motivation Questionnaire Data

Respondents	Score
R1	56
R2	46
R3	62
R4	58
R5	51
R6	60
R7	58
R8	49
R9	61
R10	61
R11	55
R12	65
R13	56
R14	57
R15	62
R16	51
R17	59
R18	56
Average	56.83

Table 2. Student Motivation Questionnaire Data

Respondents	Score
R1	30
R2	30
R3	35
R4	45
R5	25
R6	25
R7	15
R8	35
R9	15
R10	15
R11	20
R12	45
R13	35
R14	15
R15	35
R16	40
R17	15
R18	30
Average	28.05

High Motivation (80 - 100)

Highly motivated students have a strong need to achieve success and avoid failure. They focus on tasks and strive to achieve their goals. They enjoy learning and are challenged by difficult tasks. Example: Students who always complete assignments on time, always try to get the best grades, and always want to know more about the subject matter.

Medium Motivation (40 - 70)

Students with moderate motivation have a moderate need to achieve success and avoid failure. They are willing to work hard to achieve their goals, but they are not always motivated to learn. They sometimes

feel bored or frustrated with difficult tasks. Example: Students who complete assignments on time, but don't always try to get the best grades. They may not always want to know more about the subject matter, but they are willing to learn if they know it is important.

Low Motivation (10 - 30)

Students with low motivation have a weak need to achieve success and avoid failure. They are not always motivated to learn and often avoid difficult tasks. They get bored easily with difficult tasks. Example: Students who often do not complete assignments, do not try to get the best grades, and do not show interest in the subject matter.

Based on questionnaire data, it can be concluded that the level of student motivation in learning movement and style still varies. As many as 53% of students have a high level of motivation (scores 54-65). As many as 37% of students have a moderate level of motivation (score 35-53). As many as 10% of students have a low level of motivation (score 24-34). The internal factor that most influences student motivation is interest in learning (average value 4.2). Other internal factors that also have an influence are curiosity (average value 4.1), self-confidence (average value 4.0), and learning goals (average value 3.9). The external factor that most influences student motivation is the teacher (average value 4.1). Other external factors that also have an influence are learning media (average value 3.9), learning methods (average value 3.8), and peers (average value 3.7). The level of student motivation in learning movement and style still varies. This shows that efforts need to be made to increase student motivation in this learning.

The internal factor that most influences student motivation is interest in learning. This shows that it is important to arouse students' interest in learning movement and force. This can be done by making learning interesting and fun. Teachers can use various interesting learning methods, such as simulations, experiments and games. Teachers can also use interesting learning media, such as videos, images and animations. Connecting learning with everyday life. Teachers can show students how the concepts of motion and force can be applied in everyday life. Teachers can also invite students to do projects related to movement and force. Give awards to students who excel. Rewards can take the form of praise, prizes, or certificates.

Awards can help increase student motivation to study harder. The external factor that most influences student motivation is the teacher. This shows that teachers have an important role in increasing students' motivation in learning movement and style. Teachers can increase student motivation by becoming an

inspiring and enthusiastic teacher. Inspirational and enthusiastic teachers can motivate students to study harder. Teachers can show students that they have a passion for science. Give equal attention to all students. Teachers must ensure that all students feel cared for and appreciated. Teachers must provide equal opportunities for all students to learn and develop. Creating a conducive learning atmosphere. A conducive learning atmosphere can help students to focus and concentrate on studying. Teachers must create a safe, comfortable and enjoyable learning atmosphere.

Conclusion

Based on the questionnaire data and discussion above, it can be concluded that the level of student motivation in learning movement and force still needs to be increased. Internal and external factors are both important in influencing student motivation. Teachers have an important role in increasing student motivation. Students' abilities in solving problems in learning movement and style still need to be improved. Teachers need to make various efforts to improve student learning outcomes, both in terms of learning methods, learning media, as well as guidance and motivation for students.

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Author Contributions

Conceptualization, methodology, formal analysis, investigation, resources, data curation, and original draftwriting: K.; validation, review and editing, and visualization: S.P. and M.N. All authors have read and approved the published version of the manuscript.

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Conflicts of Interest

All author declares that there is no conflict of interest.

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