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Descriptive Study: Student Learning Motivation in Learning Physics of Renewable Energy Materials

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ABSTRACT

Purpose of the study: This research aims to describe student motivation in learning physics about renewable energy materials.

Methodology: This type of research uses descriptive research with the data used being quantitative. Data collection used a physics learning motivation questionnaire instrument for students. The sampling technique in this study used purposive sampling with a total sample in this study of 60 high school students. Data analysis used descriptive statistics assisted by SPSS.

Main Findings: Based on the results of student motivation questionnaire data obtained from Jambi City 2 High School and Triam Udom Suksa School, there were 60 respondents, namely an average score of 73.80. Next, the middle value (median) is 73. Then the minimum value is 56. And the maximum value is 94. The implication of this research is that by using a comprehensive and nuanced approach, this research aims to explain the factors that influence student motivation in certain academic domains. This investigation examines various elements such as curriculum design, teaching methodology, and the relevance of renewable energy materials in the learning process

Novelty/Originality of this study: The novelty of this research is that the descriptive study pioneers exploration into the previously uncharted area of student learning motivation in physics, specifically focusing on the renewable energy materials domain. This research can be a means to improve physics teaching in the classroom.

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1. INTRODUCTION

Education is basically a conscious effort to develop the potential of human resources, especially students, which is done by guiding and facilitating their learning activities. One level of education that obtains quality human resources and has high competitiveness is high school [1]–[3]. Education is a process in order to influence students to be able to adapt as best as possible to their environment, so that it will cause changes in themselves. School is a place where the educational process takes place through teaching and learning activities between teachers and students [4]–[6]. Learning is a process of effort carried out by a person to obtain new changes in behavior as a whole, as a result of his own experience in interaction with his environment [7]–[9]. Learning is a process. This means that learning activities occur dynamically and continuously, which causes changes in children.

Learning is the main activity in the educational process at school. Learning is a conscious effort to change attitudes and behavior [5], [10], [11]. In an effort to achieve behavior change, motivation is needed. Motivation is one of the factors that encourages students to want to learn. The presence or absence of learning motivation greatly influences student learning success [12]–[14]. Learning success will be achieved if you have the will and encouragement to learn. Student participation is very important in implementing the learning process in class [15], [16]. Student participation is the mental and emotional involvement of students in group situations that encourages students to develop students' thinking and feelings for achieving satisfactory learning achievements.

The initial challenge for a teacher is to arouse students' motivation to learn science. Motivation to learn science is a very important affective component because motivation to learn underlies the process of conceptualizing material, critical thinking, strategies in learning, and success in learning [17]–[19]. The physics taught by teachers in class emphasizes a learning process that requires students' abilities in mathematical, logical, rational and verbal calculations [20]. There is a strong impression among many students that physics is a lesson that is difficult to understand and less interesting.

This is due to a lack of interest and motivation to enjoy studying physics, so that many students feel less interested in studying physics. This apparently happens at a higher level, namely the University. Weak motivation to study physics is due to a lack of understanding of the nature, benefits, beauty and employment opportunities that can result from studying physics. To make studying physics more enjoyable, the benefits of studying physics need to be understood. To face any obstacles or difficulties when studying physics, learning motivation is the first capital.

Physics is a branch of natural science that studies natural phenomena that occur around us. Physics can also be used to answer questions about interesting phenomena that occur around human life. Physics is a science that studies matter and the energy contained therein [21]. Physics is a compulsory subject in high school but many students do not get satisfactory grades [22]. Because some of them have a negative perception of physics. It is from this negative perception that some students say that physics is difficult, scary, uninteresting and boring, so that physics becomes a subject they don't like, should be feared and hated [23].

Physics is a science that aims to educate students so that they can think logically, critically, have an objective nature, be disciplined in the field of physics, other fields and in everyday life so that physics needs to be studied and applied [20]. However, the reality on the ground is that physics lessons are still considered by some students to be uninteresting and difficult to understand. There are many factors behind this, including lack of motivation and student activity in the physics learning process as well as inappropriate use of media. The problem that often arises in learning in formal education (school) is the low absorption capacity of students.

This can be seen from the average student learning outcomes which are still very worrying. In this case, students cannot understand how to learn, think and motivate themselves. Motivation to learn is the main factor so that students are active in participating in learning, so that students can participate in learning well, learning objectives are achieved and the results obtained are also optimal. Motivation according to Greenberg and Baron is defined as a series of processes that move, direct and maintain individual behavior to achieve several goals. Meanwhile, Mathis and Jackson stated that motivation is an impulse that is governed by goals and rarely appears in a vacuum. The terms need, desire, desire or drive are the same as motive, which is the origin of the word motivation. Understanding motivation is important, because reactions to compensation and other human resource issues are related to motivation.

Based on the results of previous research, it was found that there is a strong relationship between student motivation and the grades students are expected to obtain in the exam. Thus motivation variables play a more important role than academic variables in predicting student performance in the future [24]. From previous research it can be seen that students will learn more than usual because of student motivation to obtain satisfactory results, students are optimistic about obtaining satisfactory grades. However, previous research has not focused on the physics material taught. As a generalization of previous research, this research was conducted to measure students' motivation to learn physics on renewable energy material.

The urgency of conducting this research is that students' enthusiasm for participating in physics learning is very important for students to have. Enthusiasm in studying physics will show students' motivation to learn. Where student motivation will move students to be able to participate in learning with enthusiasm and be able to find out the information they need independently. So this research aims to describe student motivation in learning physics about renewable energy materials .

The novelty of this research is descriptive study pioneers an exploration into the previously uncharted territory of student learning motivation in the realm of physics, specifically focusing on the captivating domain of renewable energy materials. By centering its investigation on this cutting-edge subject matter, the research introduces a novel dimension to the understanding of what drives students to engage with and excel in physics education. The study's innovative approach not only fills a significant gap in the current literature but also promises to unravel unique insights into the intersection of student motivation, physics education, and the imperative context of renewable energy. This research represents a pioneering effort to shape the future of physics education by uncovering unprecedented connections between student motivation and the dynamic field

of renewable energy materials, offering a fresh perspective that has the potential to revolutionize educational practices and inspire a new generation of learners.

2. RESEARCH METHOD

This research is descriptive research with a quantitative approach. Descriptive research is research that is intended to collect information regarding the status of an existing symptom, the state of the symptom according to what it was when the research was conducted. In addition, this research uses a quantitative approach with the hope that the information obtained can be applied generally, namely to the research population. So, quantitative descriptive research is an activity to collect extensive information about an event or condition of a variable as it is. In this study, researchers describe students' motivation for learning physics in high school.

The population of this research is high school students who are studying physics at state high school 2 Jambi City, Jambi Indonesia and Triam Udom Suksa School, Bangkok, Thailand. Sampling in research uses a purposive sampling technique, where the research sample criteria are determined by the researcher. In this research, the researchers had criteria for the research sample, namely students who were taking physics lessons at Jambi City 2 High School and Triam Udom Suksa School on the subject of renewable energy. The number of samples in this study was 60 students.

Data collection in this study used a student learning motivation questionnaire with a 4 Likert scale. The instrument used in the research was a questionnaire containing 25 statements with 4 rating scales, namely Strongly Agree, Agree, Disagree, and Strongly Disagree. Agree. The questionnaire used was in the form of a Likert scale. The Likert scale method is applied to simplify the calculation process for the final results. The instruments in this research were adopted from previous research conducted by Sari, et al [25] with reliability values (Cronbach's alpha) 0,843. Aspects of motivation to learn physics consist of attention, relevance, self-confidence, and satisfaction. The research began by distributing questionnaires to students in stages via Google Forms. The description of the categories of student learning motivation in physics learning is as follows:

Table 1. Description of categories of student learning motivation in physics learning

Interval	Category
25 - 43.75	Not good
43.76 - 62.5	Enough
62.51 - 81.25	Good
81.26 - 100	Very good

From the data obtained, data analysis was then carried out, namely filtering appropriate data, coding the data, and analyzing the data using the SPSS program. Data analysis uses descriptive statistics. From the data obtained, data analysis was then carried out, namely filtering the appropriate data, coding the data, and analyzing the data using the SPSS program. Data analysis uses descriptive statistics. This research procedure begins with a preliminary study followed by looking at the field conditions, making research instruments, distributing and collecting, then processing and analyzing the data, finally getting the results and interpreting the results of the analysis.

3. RESULTS AND DISCUSSION

This research aims to describe the learning motivation of high school students in learning physics regarding renewable energy. The research sample consisted of 60 students who were tested, so 30 students were taken from each school in the two schools. The results of data analysis obtained using SPSS regarding the identification of student motivation in learning physics at State 2 High School Jambi City and Triam Udom Suksa School, namely where each student's learning motivation is of course different. Motivation to learn can also be said to be interest in learning. Each student has a very diverse level of learning motivation. This means that there are those who have high, medium and low learning motivation. So, from the data that has been distributed to each school, SPSS results were obtained using descriptive statistics, namely the results for research describing student learning motivation in learning physics can be seen in table 2.

Table 2. Descriptive statistical description of student motivation in learning physics about renewable energy material

		Student's motivation to study	y
N	Valid	60	60
	Missing	0	0
Mean		73.8000	3.1333
Median		73.0000	3.0000
Minimum		56.00	2.00
Maximum		94.00	4.00

The classification of results obtained from student motivation in learning physics about renewable energy materials at Senior High School 2 Jambi City and Triam Udom Suksa School can be seen in table 3.

Table 3. Description of the classification of students' learning motivation at Jambi City 2 High School and Triam Udom Suksa School in learning physics about renewable energy materials

Interval	Category	Frekuensi	Persen(%)
25-43.75	Not good	12	20
43.76 - 62.5	Enough	2	3.3
62.51 - 81.25	Good	36	60
81.26 - 100	Very good	10	16.7
Total		60	100

Based on table 3, descriptive analysis of the motivation possessed by students in learning physics about renewable energy materials at Senior High School 2 Jambi City and Triam Udom Suksa School can be identified using SPSS with parameters in the form of mean, median, minimum and maximum where the results of the student motivation questionnaire data obtained from 60 respondents, namely the average value (mean) was 73.80. Next, the middle value (median) is 73. Then the minimum value is 56. And the maximum value is 94.

To identify students' learning motivation in learning physics, they can be classified using SPSS and a Likert scale. The Likert scale is used to find out how motivated students are in learning physics among all students. The grades that have been obtained will be converted into other variables that will show the motivation of the class. Can be used range to convert values to scale. Each range will represent the Likert scale used. The data analyzed was obtained from student motivation in studying questionnaires. The questionnaire results score if the student chooses Strongly Agree point 4, Agree point 3, Disagree point 2, and Strongly Disagree point 1. Classification based on the number obtained can be calculated using the formula, namely where Interval distance = highest score - lowest score divided by 4.

And based on the interval distance obtained, a classification of students' motivational attitudes can be arranged based on the scores of student respondents' answers which can be seen in table 4. The results of the research analysis classification can be said that there are 20% or 12 of the 60 research samples of students who are not good at learning motivation with a range of 25 - 43.75. Furthermore, there were 3.3% or 2 out of 60 research samples of students who had poor learning motivation with a range of 43.76 – 62.5. Then, there is a category of 60% of students or 36 of the 60 research samples of students in the good category for learning motivation with a range of 62.51 – 81.25.

And for the category of 100% students or 60 out of 60 research samples of students in the very good category regarding learning motivation with a range of 81.26 – 100 in physics learning for renewable energy materials for high school students at Jambi City 2 High School and Triam Udom Suksa School. This means that students who have motivation to study at Senior High School 2 Jambi City and Triam Udom Suksa School are categorized as good. So, it can be concluded that the identification of students' learning motivation in learning physics regarding renewable energy at Senior High School 2 Jambi City and Triam Udom Suksa School is categorized as good.

Based on the results of previous research, it is known that motivation can influence the behavior and involvement of the younger generation in social contexts [26]. The results of previous research emphasize the importance of developing and stimulating motivation in schools in order to increase the active involvement of the younger generation in the current social context. So this research was carried out as a continuation of previous research by knowing the description of students' learning motivation in learning physics about renewable energy materials. Of course, the research results obtained show that student motivation is important to measure . This research has implications in the field of physics education, especially in student teaching and learning activities in the classroom. By knowing the level of student motivation to learn, educators can determine the appropriate steps in managing teaching and learning activities, especially in learning physics and renewable energy material.

This pioneering descriptive study on student learning motivation in the context of physics education with a focus on renewable energy materials holds profound implications for the teaching of physics in both Indonesia and the global educational landscape. In the Indonesian context, where the integration of renewable energy into the curriculum is becoming increasingly vital, the findings of this research can serve as a guiding framework for educators and policymakers. By uncovering the motivational drivers specific to the study of physics with a renewable energy emphasis, the study contributes actionable insights to enhance teaching strategies tailored to the local context, fostering a more engaged and proficient cohort of physics learners in Indonesia. Moreover, on a global scale, the research introduces a novel perspective to the broader discourse on physics education, offering transferable lessons and methodologies that can benefit educators worldwide. As the global community grapples with the urgency of sustainable energy solutions, the study's insights have the potential to influence curriculum design and teaching practices internationally, ultimately shaping a more informed and motivated generation of students ready to tackle the challenges of renewable energy physics on a global scale.

As is known, renewable energy materials are becoming a hot topic of discussion in Indonesia and abroad. Renewable energy is energy obtained from natural resources whose amount of energy is greater than the energy consumed. Based on the research results, it was found that high school students in Jambi City 2 and Triam Udom Suksa The school had high and good motivation in learning physics about renewable energy. So that educators can distribute the concept of renewable energy material and students can receive the knowledge provided. Then students can be moved to apply the knowledge gained. It doesn't stop there that students who have good and high motivation will have the driving force within them to carry out certain activities in order to achieve a goal in learning science. From the descriptive statistics, there are also students whose motivation is categorized as sufficient and not good (low), so they require more treatment in learning, such as providing information services related to physics learning which is very relevant to issues occurring in the students' environment.

This research is in line with research that discusses science learning motivation which is a very important affective component because learning motivation underlies the process of material conceptualization, critical thinking, learning strategies, and success in learning [17]–[19]. Based on the in-depth findings of a descriptive study regarding student learning motivation in the realm of physics with a focus on renewable energy material, several recommendations emerged to increase the effectiveness of physics education both in Indonesia and globally. First, educators in Indonesia are encouraged to further integrate real-world applications of renewable energy materials into their teaching methods.

This can involve collaborative projects, practical experiments, and field trips to renewable energy facilities, fostering real connections between theoretical physics concepts and their practical implications. In addition, curriculum designers are advised to include interdisciplinary elements that highlight the relevance of renewable energy physics to society and the environment, thereby further strengthening students' intrinsic motivation. Globally, educators can benefit from adopting a similar student-centred and application-based approach in physics education, ensuring that curricula remain dynamic, relevant and inspiring. This descriptive research has limitations, namely that it only provides an overview of the situation at the time the research was conducted. Changes in the environment or curriculum may influence students' learning motivation over time, which was not captured in this study.

4. CONCLUSION

The conclusion of this research is that students' learning motivation in learning physics about renewable energy material is in the high category in high school 2 Jambi City and Triam Udom Suksa The school is in the good category. Good student learning motivation really supports students to participate in learning with enthusiasm. Students' enthusiasm for learning helps the knowledge transferred by educators to be easily absorbed by students. Recomendation of this research is furthermore, the dissemination of successful pedagogical practices through international collaborations and conferences is recommended, promoting a cross-cultural exchange of ideas to continually refine and innovate physics education strategies. Ultimately, these recommendations aim to catalyze a transformative shift in physics education, fostering a generation of motivated and empowered learners poised to contribute meaningfully to the evolving landscape of renewable energy.

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