

Self-Efficacy Students in Physics Learning: An Analysis by Senior High School

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ABSTRACT

There are various problems facing students in physics studies, one of which is their lack of confidence in their ability to perform tasks in physical subjects. This research aims to determine the level of students' self-efficacy in physics subjects. The study uses a quantitative descriptive approach. The sample of this study was students of X grade X high school. Data analysis using descriptive analysis using SPSS analysis 25.00. The scale used was a self-efficacy scale modified to fit the needs of physics subjects. The results of this study will show the level of students' self-efficacy of students in physics learning, which can be a reference for teachers in designing learning models that fit the needs of their students.

Keyword: Self Efficacy, Physics

1. INTRODUCTION

Physics learning, one of the branches of science, involves abstract theories (Junaidi et al., 2019; Rahayu & Romadona, 2020). Giancoli states that physics is one of the most fundamental sciences because it deals with the behavior and structure of objects. Physics is also a part of science that helps develop information technology, transportation, and energy production (Giancoli, n.d.; Hernández Armenta et al., n.d.). The field of physics covers areas such as motion, fluids, heat, sound, light, electricity, and magnetism. Modern fields like relativity, atomic structure, solid matter physics, nuclear physics, elementary physics, and astrophysics also fall into this category (Kim et al., 2021; Mansurovich, 2022).

In teaching physics, teachers must cultivate a scientific attitude, such as being curious, skeptical, always asking for evidence, open to other opinions, honest, objective, thorough, cooperative, and not giving up easily (González-Calvo et al., 2022; Hernández Armenta et al., n.d.; Mansurovich, 2022). The aim of learning physics is to improve students' thinking abilities so that they are not only capable and skilled in the psychomotor and cognitive fields, but can also help them think systematically, objectively, and creatively (Rahayu & Romadona, 2020). Ultimately, the goal of learning physics is for students to understand scientific concepts well and be able to apply them in everyday life.

However, physics learning is not integrated with the advances of science and technology and is dominated by teacher-centered learning, and the material presented is informative. Learning like this may involve fewer students actively in learning, so that students are less able to transfer the concepts of physics in solving problems faced in everyday life (Donchenko¹ et al., 2020). Since a student frequently cannot respond to the majority of a teacher's queries in physics classes, this is seen as a personal threat rather than a useful teaching tool. The term "difficulties found in learning physics" is used to describe the situation of students who don't seem to understand or respond to the physics being taught to them at their level of development (Xing & Qi, 2023). The Organization for Economic Cooperation and Development (OECD) reported that students were having difficulties in 2018, which led to problems with understanding, using oral and written words, and hindering their ability to think, speak, read, write, and comprehend concepts (Canton, 2021). The capacity to appropriately judge oneself is crucial for completing

Assignments and answering questions posed by With self-assurance or confidence, the teacher can be made simpler for students to finish their physics assignments, which can boost their performance.

Various problems are experienced by students in implementing physics learning (Tan, 2021). In recent years, there has been an increase in concern for students' mental health. Numerous studies have shown an increased incidence of psychological symptoms linked to this educational period, with stress being one of the increasingly common psychosocial issues. University students must deal with a wide range of responsibilities in their everyday life, both academic and extracurricular, that may impact their well-being (Shuell, 1990; Tan, 2021; Zhao et al., 2021). Academic pressures include adjusting to a new environment, being overworked, not having enough time to complete assignments, preparing for and taking tests, and being under pressure to perform (Levine et al., 2020). Non-academic demands include moving, the desire to forge new social connections, disagreements with partners, family, or friends, financial issues, and fears about the future of their employment. Significant negative effects from stress on a student's academic performance can be severe (e.g., decreased concentration or memorization skills, a lack of commitment to studying, and an increase in absences from class) (Aslan, 2021; Shuell, 1990).

2. LITERARURE REVIEW

Self-efficacy is a general ability that consists of cognitive, social, emotional, and behavioral aspects. Individuals must be able to process those aspects in order to a specific goal (Alimohammadi et al., 2020; Schunk & DiBenedetto, 2021). Self-efficacy is a multi-purpose instrument because it involves not only the ability, but also the belief that individuals can do things under different conditions (Agbaria, 2021). Self-efficacy acts as a machine for generating human abilities. If a person has strong self-efficacy, then they are highly motivated and may even exhibit extreme views in the face of a situation . Self-efficacy does not grow by itself, but rather is formed through the interaction of personal characteristics, behavior patterns of behavior and environmental factors. These relationships are natural, personal, and social, and there may be long and complex process to create these relationships. There are four sources of information that make important contributions to the formation of self-efficacy, namely, enactives mastery experiences, vicarious experiences, verbal persuasion, and other related social recognitions, and the psychological and affective state of the individual (physiological and affective states) (Mehmood, 2019; Moran et al., 2021).

One of the goals of learning physics is to improve students' reasoning and logical skills. Additionally, learning physics is a way to systematically develop students' thinking patterns. Various factors influence the physics learning process, including physics; these include learning objectives, teachers, teaching activities, students, evaluation systems, and others . All of these factors are interrelated and contribute to the success of physics learning. As a teacher, to achieve the goal of physics learning, one must possess strong physics abilities and teaching skills.

Self-efficacy in physics is a self-concept that refers to a person's belief in their ability to perform or solve tasks or physical problems. Physics learning ability and teacher teaching skills are closely related to each other (Yates et al., 2023). Self-efficacy in teaching physics relates to the level of student confidence in their capacity to understand and comprehend the values and materials contained in physics learning that conform to a specific standard. Self-efficacy is also defined as their belief in their ability to regulate and implement physical learning actions in order to achieve a specific goal. They are also convinced that they are able to face challenges and predict how much effort will be needed for them (Schunk & DiBenedetto, 2021).

Self-efficacy is one of the non-cognitive internal components that strongly influences physical learning outcomes (Al-Bantani, 2022). He believes that improving student physics self-efficacy during the physical learning process in high school is crucial. Besides being an important component of a successful study of physics, self-effectiveness is the most important factor in independent learning. It affects the student's affective, cognitive, and connational functions. So far, it can be assumed that no research has studied the level of physical self-efficacy of Indonesian students. The aim of this study is to identify the level of physical self-efficacy of students at SMAN 1 Bireun Aceh.

3. METHOD

The methodology for this study is a quantitative descriptive approach. In order to provide structured, accurate, and authentic descriptions of information regarding facts, signs, and characteristics of a certain group of individuals, descriptive techniques are utilized in-depth analysis of a phenomenon. The population of this study consisted of SMAN 1 Bireun Aceh students who were selected using the convenience sampling technique, which involves selecting random objects or subjects who just so happen to be in the researchers' line of sight (Sugiyono & Lestari, 2021). The sample size for the study was determined by the researchers using the Slovin formula, which resulted in a sample size of 151 samples. A questionnaire on learning Physics self-efficacy is used for collecting data, and it is a modification of one of the research variables utilized in the study of the relationship between emotion-focused coping techniques and Physics self-efficacy learning. Data collection, processing, showcasing of descriptive data, and deriving inferences from research findings are all continuing aspects of data analysis.

4. RESULT

According to the study's results, students experienced an average their degree of Physics self-efficacy of 72.22, with a standard deviation of 8.78. These findings are presented by the category of academic burnout in the table below:

Table 2. Results Based on Sub Variables

| Sub Variable | Mean | % Mean | Std. Deviation | Desc |
|--------------|-------|--------|----------------|------|
| Level | 27.43 | 47.22% | 5.342 | Low |
| strength | 25.12 | 46.86% | 4.994 | Low |
| generality | 28.75 | 47.45% | 5.442 | Low |
| | 27.1 | 47.18% | 5.259 | |

Based on the results in table 2 above, 48.67% of the sub-variables for level, strength and generality fall into the low group. 47.18% of these sub-variables fall into the low category. In addition, the information from the study on student Physics self-efficacy conducted in SMAN 1 Bireun.

Students' self-efficacy in studying physics falls into the low category due to the student's degree of confidence in their ability to meet values and material understanding according to certain standards. It shows that students' confidence in physics still needs to be enhanced. The effectiveness of studying students on these low physics subjects shows how confident students are and are able to choose activities, which affects how much students are engaged in physical activities. Students in this study strongly agree that they are a self capable of developing themselves and constantly seeking to find new ways to solve the problems of learning physics (Kim et al., 2021; Tan, 2021).

Considering the findings of this study will explain how students' self-understanding and physical literacy skills are linked to their self-efficacy character differences. Self-effectiveness is the belief that everyone has about their ability to perform and complete tasks in specific situations and conditions to overcome obstacles and a goal. Some students find studying physics boring and difficult (Susanti, 2020). Recognizing and using a variety of media, methods, techniques, approaches, and fun physical learning models at the basic level is the key to doing so and changing the "negative reputation" of this physical learning. Furthermore, in the context of learning processes, the method, models, strategies, and media are used to create a comfortable environment for students (Giancoli, n.d.; Kim et al., 2021).

This allows students to transform the physics learning that is usually stressful and focused into a more exciting and enjoyable environment. Socio-cognitive theory says that a person's achievement or performance depends on a combination of behavior, personal elements, and environmental conditions (Ferdiansyah, 2023; Noviyanti et al., 2023; Rachmawati et al., 2021). Studies have shown that self-effectiveness can affect students' ability to solve problems comprehensively and effectively. In other words, self-effectiveness includes an understanding of the role of self-control in terms of thought adjustment, motivation and support, and adjustments in the domain of emotional and psychological management. Successful students can solve problems with enthusiasm, persistence, and courage. Very different for students with low or moderate levels of self-efficiency. Self-efficient students often avoid tasks and give up when faced with problems. On the other hand, self-effective students are usually equal to their peers (Rachmawati et al., 2021).

5. DISCUSSION

There are 3 indicators of student self-ability, namely Level, Strength, and Generality. a) The level in this level dimension is related to the level of difficulty of the task that a person believes can be completed (Rachmawati et al., 2021; Schunk & DiBenedetto, 2021). If a person is faced with problems or tasks that are arranged according to a certain level of difficulty, his abilities will fall into tasks that are easy, medium, or difficult according to the limits of the person's perceived abilities. The choice of actions to try or avoid is influenced by the level of difficulty. Individuals will try to do things they think they are capable of doing, and they will avoid things they think are beyond their limits (Alimohammadi et al., 2020). This is very different from students who have low or medium levels of self-efficacy. Students who lack self-efficacy often avoid tasks and give up when faced with problems. On the other hand, students whose self-efficacy is usually on par with their peers.

The strength dimension refers to the strength or weakness of a person's faith. individuals about their abilities. Those with weak self-confidence tend to be easily shaken by small obstacles in completing tasks. On the other hand, those who have strong self-confidence about their abilities tend to never give up and continue to improve their efforts even when facing obstacles. In general terms, this size is related to the breadth of the task being carried out. Some people have beliefs limited to a particular activity and situation, and some people spread them across a wide range of activities and situations (Al-Bantani, 2022; Aslan, 2021; Yates et al., 2023).

As students' levels of self-efficacy are high, strong communication skills are required to present ideas. Input and questions can help realize existing ideas. Students who have a high level of independence will be able to use their speaking skills to provide necessary advice and use all their thoughts or ideas to provide answers to each question. As a result, they can be accepted by all students, and vice versa (Nasir & Iqbal, 2019; Pertiwi et al., 2022; Truong & Wang, 2019). Additionally, Bandura states that even though a situation will be very difficult compared to the actual situation, people who have high levels of self-efficacy will devote attention and effort to the demands of the situation, and obstacles will encourage them to try harder. In this study, self-efficacy refers to students' intrinsic drive (Nasir & Iqbal, 2019), self-confidence (Rachmawati et

al., 2021), and self-efficacy (Sharma & Kumra, 2022) while studying at home during a national pandemic. Self-efficacy is expected to help students become more independent when studying at home (Morales-Rodríguez & Pérez-Mármol, 2019).

As stated by previous researchers, increasing physics literacy skills can have an impact on students' positive thinking. This research found that students who have high self-confidence and a positive view of themselves have the potential to improve their ability to solve physics problems (Ananda & Wandini, 2022; Lestari et al., 2023). This research shows that the ability to solve physics problems is greatly helped by positive thinking skills. Therefore, it is very important to instill optimism in the minds of students so that they get used to seeing things from a positive perspective. Positive thinking is a reflective activity carried out with the aim of building and generating positive aspects of ourselves, which have potential, enthusiasm, determination, and self-confidence (Mauliyda et al., 2020; Sharma & Kumra, 2022). Students who are trained to think positively will develop and awaken positive aspects in themselves, which in turn will help them see.

6. CONCLUSION

Self-efficacy greatly influences students' physics abilities. The higher the student's level of self-efficacy, the better their physics skills. To improve students' mathematical literacy skills, for example, students are accustomed to solving problems, students are accustomed to speaking, and teachers must use learning methods and approaches that encourage students to participate in mathematical literacy activities. So that students are interested in learning and speak boldly, teachers can use an interesting and fun physics learning approach.

7. REFERENCES

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