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The Relationship between Interest and Learning Motivation to Natural Science Learning Outcomes: A Narrative Review Study

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ABSTRACT

Learning outcomes are a crucial factor in determining success or failure in learning. Many students demonstrate substandard learning outcomes, falling below the minimum criteria. Learning outcomes, both favorable and unfavorable, are influenced by various elements, including motivation and interest in the learning process. Everyone has different motivations and interests in the learning process. Motivation and interest in learning are correlated with learning outcomes. Therefore, this study aims to investigate the correlation between interest, motivation, and learning outcomes, specifically in natural science subjects. The type of research conducted is qualitative with the narrative review method. The database for this narrative review consists of articles from Google Scholar, including those indexed in SINTA and other reputable international sources, published within the last ten years. The results of the study indicate that a literature evaluation of 25 publications revealed a substantial positive correlation between motivation, learning interest, and learning outcomes. Natural sciences learning outcomes are directly correlated with motivation and engagement in the learning process. Therefore, it is concluded that there is a correlation between motivation, learning interest, and natural sciences learning outcomes.

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1. INTRODUCTION

As social beings, humans must possess ethics and a willingness to continuously learn to improve their daily quality of life, as learning from experience can guide decision-making (Carvalho et al., 2022). This work demonstrates that learning is a crucial determinant that significantly influences human behavior and serves as a standard for human understanding (Osher et al., 2020). Learning, etymologically, refers to a generally permanent change in individual behavior resulting from experience and environmental interactions, encompassing cognitive processes (Illeris, 2018; Olson & Ramirez, 2020). Education is expected to produce a quality generation that will drive national growth. Law Number 20 of 2003 concerning the National Education System stipulates that national education functions to improve capabilities and foster a dignified

national character and civilization, with the aim of enriching the nation's life (Khunaifi & Matlani, 2019). To achieve national education goals, the objective needs to be aligned with improving the quality of learning (Helda & Syahrani, 2022).

The quality of learning is closely related to the competence of educators and the talents of students (Blömeke et al., 2022; Darling-Hammond, 2021). Educators, as facilitators of the learning process, are crucial factors in the effectiveness of education. A professional educator is not only an expert in their field but must also guide, lead by example, and continually motivate students to develop and progress (Darling-Hammond et al., 2024). Apart from teacher variables, the learning process intrinsically links improving the quality of learning to student factors. Therefore, improving the quality of learning must be balanced with improving the quality of students (Lovat, 2010; Madani, 2019).

Improved student quality is evident in academic achievement or learning outcomes (Sadler, 2017). Huang et al. (2020) argue that learning outcomes are transformations in students encompassing cognitive, emotional, and psychomotor dimensions resulting from the learning process. Furthermore, Caspersen and Smeby (2018) explain the concept of learning outcomes, stating that they represent a student's level of mastery of academic content, as measured by scores obtained from assessments in specific disciplines.

For a student, achieving positive learning outcomes is a source of pride. Students who achieve satisfactory learning outcomes will consistently strive to maintain and improve their academic achievement (Francis & Babu, 2019; Gamage et al., 2021). Achieving satisfactory learning outcomes is a challenge in itself, as student achievement is influenced by various factors and requires significant effort. Meanwhile, Camacho-Morles et al. (2021) emphasize that various factors influencing learning outcomes determine a person's success or failure in learning. These factors are categorized as internal, including health, intelligence, talent, interests, motivation, and learning methodology, and external, including family, educational institutions, the community, and the surrounding environment. Interest and motivation are intrinsic aspects that influence students' learning processes (Fitri, 2020; Fırat et al., 2018; Malone & Lepper, 2021). Interest is a sustained tendency to focus on and maintain a particular activity. A person engaged in an activity will consistently focus on it with pleasure. Fitri (2020) emphasized that interest is related to a way of moving that encourages a person to engage with individuals, objects, activities, and other experiences, triggered by the action itself.

Student motivation drives learning, development, and goal achievement (Skinner, 2023; Urhahne & Wijnia, 2023). High-IQ students without motivation may underachieve. Learning motivation varies among students (Vidergor, 2021). Thus, pupils' learning motivation must be maintained. The students themselves and educators who fail to motivate them both contribute to student learning loss. Motivating students and helping them create learning activities is essential for educators (Al-Said, 2023; Shin & Bolkan, 2021).

Teachers must provide more and better learning opportunities to boost student learning (Kim et al., 2019; Madani, 2019). Actively engaging kids improves learning. Teachers must be committed to learning to engage and excite students (Yan et al., 2023). For dynamic and inventive teaching, educators must grasp their subjects (Chan & Yung, 2018; Yip, 2025). Science teachers in elementary, middle, and high schools must comprehend scientific learning. Science is taught in elementary schools. Due to science's enormous nature, students find this topic boring (Shirazi, 2017). Elementary school science covers natural science, which studies living things, humans, plants, animals, and their growth and development. Thus, science teachers must illustrate or interact with phenomena to assist pupils in understanding the material.

However, empirical evidence reveals that science training often adopts approaches that don't match the subject's nature (Bevan, 2017; Yoon et al., 2018). Learners are not encouraged to acquire cognitive skills. Classroom learning generally stresses memory without encouraging pupils to apply knowledge to real-life situations (Yilmaz, 2011). Students lose interest in class rapidly during this learning process. Students disregard instruction and play games or chat with peers, producing a distracted classroom and poor learning.

The instructor's inadequate use of learning material in class hampers science comprehension (Febrina & Setiawan, 2024; So et al., 2019). Despite many science materials, including widely available images, teacher innovation and student motivation and excitement for science learning are lacking. Various learning methods have different outcomes. Students are enthusiastic about learning. Direct involvement in practical work helps them learn the subject. Students' lack of excitement and ambition for achievement suggests that decreased interest and motivation in studying contribute to poor scientific learning results.

Suboptimal learning results are caused by several factors, including student interest and motivation, which are interconnected and mutually reinforcing (Cao & Yu, 2023; Vu et al., 2022). Several studiesshow a substantial association between interest and motivation, but few analyze the low correlation between motivation and science learning outcomes. Therefore, this paper aims to fill the gap in previous research by examining motivation, learning interest, and students' scientific learning outcomes.

2. METHOD

The research used was qualitative, employing a narrative review method. The narrative review method was chosen for its flexibility in describing and interpreting complex or broad topics, presenting fresh perspectives on established or under-researched fields, and identifying knowledge gaps and tracking scientific developments. Relevant publications related to the research were collected from the Google Scholar indexed database using the keywords "learning motivation," "learning interest," and "science learning outcomes," published over the past ten (10) years. Furthermore, scientific publications were selected by excluding publications with analogous thematic concepts identified in each source.

Considerations in article selection included the use of publicly accessible scientific studies published within the past decade, the conclusions and observations presented in the articles, and their relevance to the research topic. A total of twenty-five (25) scientific articles were used, originating from the SINTA database and reputable international publications. Figure 1 illustrates the flow of the narrative review research.

Figure 1. Narrative Review Flow

3. RESULTS AND DISCUSSION

Interest is the foundation for an effective learning process. Students who enjoy a subject will quickly understand and assimilate the information presented by the instructor. Interest drives students to focus and fosters strong engagement in learning activities (Fitri, 2020; Fırat et al., 2018). If learning content does not align with their interests, their learning efficacy will decrease. Consequently, if someone is interested in a subject, it indicates their motivation to actively participate (Malone & Lepper, 2021; Owens et al., 2020; Severe et al., 2024). This research theoretically reinforces the idea that learning interest improves learning outcomes, based on the supporting ideas outlined previously. Thus, we have theoretically strengthened the concept that learning interest significantly enhances science learning.

Zhang et al. (2025) classify learning motivation as an intrinsic and extrinsic drive within students to modify behavior, usually accompanied by several supporting indicators or components. Consequently, motivation is a crucial element in the learning process, increasing student engagement in learning. Motivated students demonstrate greater enthusiasm for learning, even when working on assigned tasks (Moè et al., 2021; Zhang et al., 2022). Consequently, motivated students' academic achievement improves. The relationship between learning motivation and science learning outcomes is positive;

thus, increased student motivation correlates with improved science learning outcomes each year.

Research by Wahyuni et al. (2020) shows a positive relationship between learning interest and learning outcomes, with a correlation coefficient categorized as low. Research by Andira et al. (2022) indicates that students' learning interest levels are below the moderate range according to the frequency distribution of motivation data. Furthermore, Roure et al. (2021) demonstrated in their study that students exhibited high curiosity after completing a questionnaire. Strong learning interest will increase if students aspire to achieve optimal learning outcomes, which are characterized by enthusiasm and a lack of boredom. Rahmi et al. (2021) conducted research that generally categorizes students who demonstrate motivation in biology learning as having good performance.

Effective motivation has a significant impact on students' academic outcomes. Jansen et al. (2022) confirmed that student motivation is considered strong. This idea is also supported by correlational research conducted by Kinasih and Mariana (2021), which revealed a strong relationship between motivation, learning interest, and learning outcomes. Motivation and learning interest show a substantial positive correlation with learning outcomes. Learning outcomes, whether high or low, are correlated with student motivation and academic achievement. Consequently, high motivation and interest will result in better learning outcomes. However, if motivation and interest decline, learning outcomes will also decline. The drive to learn significantly influences students' learning efforts. Intrinsic motivation within students stimulates the learning process, maintains its sustainability, and guides them toward achieving desired goals (Lee & Kwon, 2023; Merdiaty & Sulistiasih, 2024; Oudeyer et al., 2016).

Urhahne and Wijnia (2023) found in their research that motivation correlates with goal achievement and success. Students motivated purely by the desire to pass a subject will exhibit different learning activities, with attitudes and actions inconsistent with academic requirements, compared to those committed to thorough study. Improving poor learning motivation is possible. Al-Said (2023) highlighted that various methods, such as encouraging students, setting realistic expectations, providing incentives, and guiding behavior, can enhance learning motivation. Apathy and disinterest in learning can stem from various circumstances and can be reduced by fostering drive and enthusiasm for future learning, creating a supportive environment, and avoiding harmful questions that can diminish learning interest.

Increasing learning motivation is influenced by aspects such as aspirations, learning abilities, student circumstances, environmental conditions, dynamic elements in learning, and teacher efforts in teaching students (Al-Said, 2023; Daniel et al., 2024; Merdiaty & Sulistiasih, 2024). Kasemy et al. (2022) showed that learning motivation is influenced by various factors, including the completeness of learning, the student's intellectual level, emotional intelligence, family and environmental conditions, and individual learning styles. Students must be motivated, as persistence is essential for successful learning (Xu et al., 2023).

Interest is a characteristic that generally persists. Student disinterest in learning will result in poor learning outcomes (Fitri, 2020). Individuals can reduce apathy towards learning by striving to achieve their goals, which stems from monotonous learning experiences. We can increase interest. We can increase interest by stimulating learning, fulfilling needs, connecting problems to previous experiences, offering opportunities for success, and using a variety of pedagogical approaches. Interest will accompany the learning process, making it effective. Teachers must appropriately encourage the stimulation of learning interest and topic mastery to improve student learning outcomes (Affiana Muthik et al., 2022; Biggs, 2012). Increased interest in learning can stem from various factors: students' fascination with the biology curriculum, their belief in the benefits of studying science, a strong desire to excel in the subject to achieve higher grades, satisfaction with the biology instructor's pedagogical approach, and the adequacy of learning facilities and infrastructure.

The data shows a positive and significant correlation between interest and motivation in learning and science learning outcomes. Consequently, these two parameters can serve as indicators of student learning achievement, particularly in science disciplines and other subjects overall.

The implications of these findings serve as input and guidance for educators and institutions to increase student motivation through ongoing supervision and coaching. Providing such incentives is considered crucial, as a lack of encouragement from educators and institutions can reduce student engagement in learning, negatively impacting their academic performance. Students are expected to motivate themselves and encourage their peers to actively engage in learning both at school and at home, consistently striving to stimulate interest in learning and improve their academic performance in all subjects, not just science.

4. CONCLUSION

The results of this narrative review indicate that motivation and interest in learning are significantly positively correlated with learning outcomes in natural sciences, indicating a direct proportional relationship. High motivation and interest in learning correlate with improved learning outcomes, while low motivation and interest are associated with decreased learning outcomes. Therefore, improving student motivation and interest in learning is crucial, which can provide input and guidance for educators and institutions. We hope that teachers and schools will provide students with more learning incentives, along with consistent and ongoing support and guidance.

As a recommendation, the results of this study can serve as a reference for teachers in managing or preparing classroom learning, considering student interests and motivation. Further research suggests the development of interactive learning media that can stimulate interest and motivation in learning, particularly in the field of natural sciences.

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