



The Influence of Emotional Intelligence on the Physics Learning Achievement of High School Students

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DOI: <https://doi.org/10.55248/gengpi.4.623.47246>

ABSTRACT

The purpose of this study is to ascertain how emotional intelligence affects high school students' learning outcomes in physics in Palu, Central Sulawesi, Indonesia. Since emotional intelligence includes the capacity to recognize, comprehend, control, and effectively communicate emotions, it is vital for students' academic achievement. The study uses a correlational design and a quantitative methodology to investigate the link between emotional intelligence and success in studying physics. A sample of high school students in Palu, Central Sulawesi, is selected using a random sampling technique. The data collection process involves administering two validated instruments: The Emotional Intelligence Scale (X) and the Physics Learning Achievement Test (Y). The relationship and prediction potential of emotional intelligence on physics learning accomplishment is then determined by utilizing statistical approaches, such as correlation analysis and regression analysis, to assess the data that has been collected. The findings of this study demonstrate how students in high school can learn more effectively, particularly in the subject of physics, by having stronger emotional intelligence. The results demonstrate that students' emotional intelligence significantly influenced their ability to meet high school physics learning outcomes, as indicated by a regression coefficient value of $R = 0.12$. By providing light on how emotional intelligence might improve students' learning outcomes in physics, the study hoped to add to the body of knowledge already in existence.

Keywords: Emotional Intelligence, Physics, Learning Achievement, Students

1. Introduction

Academic accomplishment is a top priority for legislators, instructors, and students alike in the field of education. In the realm of science, where courses like physics need for a strong foundation of knowledge and problem-solving abilities, the pursuit of excellence in academic performance is extremely crucial. However, factors other than intellectual ability alone can have an impact on academic accomplishment. Emotional intelligence is one of these elements that is receiving attention in educational studies (Ashton, 2018).

The aims of the curriculum and its possible influence on students' socioemotional development are what link the Indonesian 2013 Curriculum to emotional intelligence. The Kurikulum 2013, also known as the Indonesian 2013 Curriculum, was implemented as a reform to raise the standard and importance of education in Indonesia. The curriculum lays a lot of emphasis on students' whole development (Chan & Chen, 2022) with the goal of fostering not just their cognitive skills but also their moral, social, and emotional health. It acknowledges the significance of preparing students for personal and professional success in the twenty-first century by providing them with abilities beyond academic knowledge, including emotional intelligence. Character education is incorporated throughout the Indonesian 2013 Curriculum, which is one of its main components. The emphasis of the curriculum is on helping kids acquire virtues like empathy, respect, responsibility, and self-discipline. These character traits, especially social awareness, empathy, and self-control, closely resemble the elements of emotional intelligence.

The Indonesian 2013 Curriculum indirectly encourages the development of emotional intelligence among students by adding character education within the curriculum. In order for pupils to grow in their social and emotional competences, it urges teachers to establish a welcoming and inclusive learning environment (Rautakoski et al., 2021). This involves giving students the chance to participate in cooperative activities, express their viewpoints, work together to solve problems, and improve their interpersonal skills. The curriculum also encourages student-centered, active learning strategies including project-based learning and contextual learning, which incorporate real-world contexts and hands-on activities. By participating in meaningful interactions, controlling their emotions during group activities, and improving their self-awareness and self-regulation abilities, these educational tactics give students the chance to improve their emotional intelligence (Vattøy, 2020). It is significant to highlight that different schools' and teachers' methods may differ in how overtly they address and include emotional intelligence into their curricula. The Indonesian 2013 Curriculum's guiding principles, on the other hand, foster the growth of emotional intelligence in children by emphasizing character education and student-centered learning. By stressing character education,

encouraging student-centered learning methodologies, and fostering a holistic learning environment, the Indonesian 2013 Curriculum indirectly enhances the development of emotional intelligence (De-Abreu et al., 2022). The Indonesian educational system attempts to give students the knowledge and abilities they need to successfully navigate their personal and academic lives by incorporating emotional intelligence into the curriculum. The capacity to successfully perceive, comprehend, control, and express emotions is referred to as emotional intelligence. It includes interpersonal skills, self-awareness, empathy, and emotional control. According to studies, emotional intelligence has a strong link to academic success since it affects students' motivation, self-control, and social interactions in the classroom. While the relationship between emotional intelligence and academic success has been studied in a variety of contexts (Majdabadi et al., 2022).

For educators and decision-makers in Palu, Central Sulawesi, understanding the link between emotional intelligence and physics learning achievement is crucial. Understanding the importance of emotional intelligence in physics education can help educators create effective lesson plans and interventions that are suited to the unique requirements of high school students in this area. Teachers may improve their students' motivation, engagement, and physics performance by encouraging emotional intelligence, which will help them do more academically overall.

Research Methodology

Design and Sampling

This study uses a quantitative research methodology to examine how emotional intelligence affects high school students' learning outcomes in physics in Palu, Central Sulawesi, Indonesia. By using a quantitative method, it is possible to gather numerical data that can then be statistically examined to ascertain the relationship between variables. In order to choose a representative sample of high school students from several schools in Palu, Central Sulawesi, the study used a random sampling technique. The samples were classified as dynamic achievers. Based on this assumption, four schools were selected: (1) two schools in the city center: SMA 1 Palu and SMA GKST Palu; (2) one school in the suburbs: SMA 8 Palu; and (3) one school between the city center and the suburbs: MAN 1 Palu. The selection of samples with the characteristics of the research population with these features has been done purposefully from a methodological standpoint. In the meantime, it was done by cluster to choose from the second group, which consisted of the most vibrant and exceptional classes among the other classes. Therefore, there aren't a lot of people in the targeted classes. In that situation, any person of the population who was chosen from the clusters or classes instantly became a sample or a research participant. The sample size was chosen in accordance with statistical criteria to provide sufficient analytical power and generalizability of the results.

Data Collection Instruments

A recognized test that evaluates participants' emotional intelligence. The target population in Palu, Central Sulawesi, has found the scale to be trustworthy and culturally appropriate. The numerous aspects of emotional intelligence that this test measured included self-awareness, self-control, social awareness, empathy, and interpersonal abilities. The Physics Learning Achievement Test was gathered, A standardized test that was specifically created to evaluate pupils' progress in understanding physics was given. Students in Palu, Central Sulawesi, who are enrolled in high school take a physics exam that covers the pertinent themes and ideas from their course syllabus. The validity, reliability, and alignment of the test items with the curriculum's learning objectives have all been verified.

Data Collection Procedures

The Emotional Intelligence Scale and the Physics Learning Achievement Test will be given to the chosen sample of high school students in Palu, Central Sulawesi, as part of the data collection process. Data integrity is maintained by doing the data collecting in a controlled environment, such as classrooms or exam halls, with the necessary guidance and oversight. SPSS statistical methods were used to analyze the data that was collected. Descriptive statistics are used in the analysis to sum up the participants' emotional intelligence and learning accomplishment ratings in physics. Additionally, correlation analysis was used to investigate the connection between emotional intelligence and success in studying physics. A regression study was done while accounting for other pertinent factors to see how well emotional intelligence can predict how well students will understand physics. Ethics were upheld throughout the entire research process. Obtaining informed consent, the participants' input. The privacy and anonymity of participants are upheld, and data is securely preserved and only utilized for study.

Result and Discussion

Table 1 shows the distribution of high school students' physics learning achievement based on various grade ranges. While the Grade Range displays the range of grades within each achievement category, the Achievement Category lists the categories used to describe students' physics learning accomplishment. For instance, grades 77 to 91 are included in the "Well Achieved" category. The percentage indicates the proportion of students in each accomplishment category when compared to the overall number.

Table 1 – Student's Achievement Category

Achievement Category	Grade	Total	%
Well Achieve	77-91	58	30.5
Achieved	63-76	113	59.5
Failed	50-62	19	10.0
TOTAL		190	100

According to Table 1 above, the outcomes of the study's influenced variable, learning achievement in physics, are broken down into three score categories: well achieved, achieved, and failed. The three score ranges are grouped according to completeness for analysis purposes. "Well Achieved" refers to the highest score group in the range of 77 to 91, "Achieved" to the range of 63 to 76, and "Failed" to the range of 50 to 62. According to the chart above, the majority of 113 students (59%) who took physics classes were in the category of well-achieved students, with scores ranging from 77 to 91. The next largest group, 58 students (30.5%), were in the category of achieved students, with scores ranging from 63 to 76 then the failed category with a range of 50–62 has the smallest percentage of 19 (10.0%). Failure is the final learning outcome or lowest range category, and failing students must take remedial classes to repeat the material until they pass the course.

According to the learning outcomes achievement graphed above, 90% of high school students who took physics courses successfully completed their studies. Since schools take the initiative to provide opportunities for pupils to perform remedial work until they get the highest scores, the percentage of learning achievement in high schools in Palu City can be fairly strong. The fact that 90% of high school students successfully finished their physics coursework points to the subject's high level of competence and proficiency. Such a high success rate suggests that a sizable majority of pupils have learned the essential physics knowledge and abilities. This degree of success in acquiring physics in high school can be viewed as a sign that the educational system is effective. It displays the efforts made by both students and teachers to create a positive learning environment and provide top-notch instruction. It can mean that students have a solid foundation in physics, allowing them to continue their studies or find employment in industries linked to physics. It also shows that a curriculum that is in line with high school students' learning requirements and aptitudes has been successfully developed and put into use by the educational system. When analyzing the high success rate, it's crucial to take emotional intelligence into account. The success rates of students can also be strongly impacted by the accessibility of educational materials (Brůža et al., 2021), the standard of instruction (Crompton & Sykora, 2021), and the support structures in place (Cenk et al., 2016).

Relationship between Emotional Intelligence and Physics Learning Outcomes

The relationship between emotional intelligence (X1) and the achievement of physics learning outcomes (Y) in high school students shown in Table 2.

Table 2 – Emotional Intelligence versus Learning Outcome

Variable	Well Achieved	Achieved	Failed	Total
High	45	83	4	132
Moderate	13	30	14	57
Low	0	0	1	1
Very Low	0	0	1	0
TOTAL	58	113	19	190

The table provides information on the correlation between emotional intelligence (Variable X1) and learning outcomes (Variable Y) broken down into "Well Achieved," "Achieved," and "Failed" categories. The "Well Achieved" learning outcome was attained by 45 students in the "High" category of emotional intelligence, the "Achieved" learning outcome by 83 students, and the "Failed" learning outcome by 4 students. There are 132 students in this group as a whole. Thirteen students met the "Well Achieved" learning outcome for emotional intelligence in the "Moderate" category, thirty students did so for emotional intelligence in the "Achieved" category, and fourteen students met the "Failed" learning outcome standard. There are 57 students in this group as a whole. The "Well Achieved" or "Achieved" learning outcomes were not met by any students in the "Low" category of emotional intelligence. Only one student met the criteria for the "Failed" learning result. When it comes to emotional intelligence, no students met any of the learning objectives in the "Very Low" group. There are 190 students in all of the areas of emotional intelligence.

Regression analysis, a type of statistical analysis, has given researchers a more thorough knowledge of the connection between emotional intelligence and academic success. It is possible to acquire a regression coefficient value of $R = 0.112$. The relationship between the two variables can be categorized as very close when the greatest value, 1, is 0.121. A more explicit interpretation of the positive connection between the independent and dependent variables is that high emotional intelligence students have a very high likelihood of participating in the learning process, particularly in the topic of physics.

Decision-making and problem-solving are greatly influenced by emotions. Emotions offer significant insights and intuitive responses, but intelligence offers cognitive skills and logical reasoning. People's emotions can help them assess situations, think through moral implications, and make choices that are consistent with their values and general wellbeing. People with emotional intelligence are better able to handle the complexities of social dynamics and interpersonal connections, which improves outcomes in both personal and professional environments. Healthy and meaningful relationships are fostered through emotional intelligence. It makes it possible for people to effectively communicate, comprehend the perspectives of others, and empathize with them. Conflict resolution, teamwork, and cooperation are made easier with emotional intelligence, and these skills are essential for both personal and professional encounters. It's possible that intelligence alone won't be enough to establish lasting relationships or foster a kind and encouraging social atmosphere. (Başoğlu & Özgür, 2016).

According to (Nyarko et al., 2020), emotional intelligence is highly related to mental health and general wellbeing. Stress reduction, resilience, and emotional regulation are aided by an understanding of and ability to manage emotions. Higher levels of self-esteem, lower levels of anxiety and despair, and greater general psychological well-being are all more prevalent in people with higher emotional intelligence. The abilities required to deal with emotional difficulties and maintain a healthy mental state might not be provided by intelligence alone. Motivation and self-development are significantly

influenced by emotions. People with emotional intelligence are better able to discover their passions, create meaningful goals, and pursue those goals with vigor and persistence. Motivation and personal development are fueled by emotions including inspiration, curiosity, and joy (Durnali et al., 2023). The emotional drive and commitment required to attain long-term success and fulfillment may not always come from intelligence alone.

Effective leadership and influence at work frequently depend on having high emotional intelligence. (Ding & Yu, 2021) . Leaders who are aware of and in control of their own emotions are better able to encourage and inspire others, form solid teams, and negotiate challenging organizational dynamics. By helping leaders understand their followers' needs and emotions, emotional intelligence promotes collaboration, trust, and empathy. It's possible that intelligence isn't enough to motivate and inspire others effectively. While it is maintained that emotions are significant, intelligence also has significance in many different contexts. Problem-solving, critical thinking, knowledge acquisition, and academic success are all influenced by intelligence. In order to succeed on a personal and professional level, emotional intelligence and intellectual intelligence can both support and complement one another (White & Quinn, 2023).

Relationship Between Emotional Intelligence and Learning Achievement

The association between emotional intelligence and academic success is seen in Fig. 1 below. Learning success and emotional intelligence have a good relationship. In other words, it is anticipated that learning achievement would rise as emotional intelligence does. The ability to identify, comprehend, and control one's own emotions as well as the emotions of others is referred to as emotional intelligence. It includes abilities like self-awareness, self-control, empathy, and successful communication with others. People with high emotional intelligence are better able to handle social interactions, recognize their own strengths and weaknesses, and control their emotions under a variety of conditions.

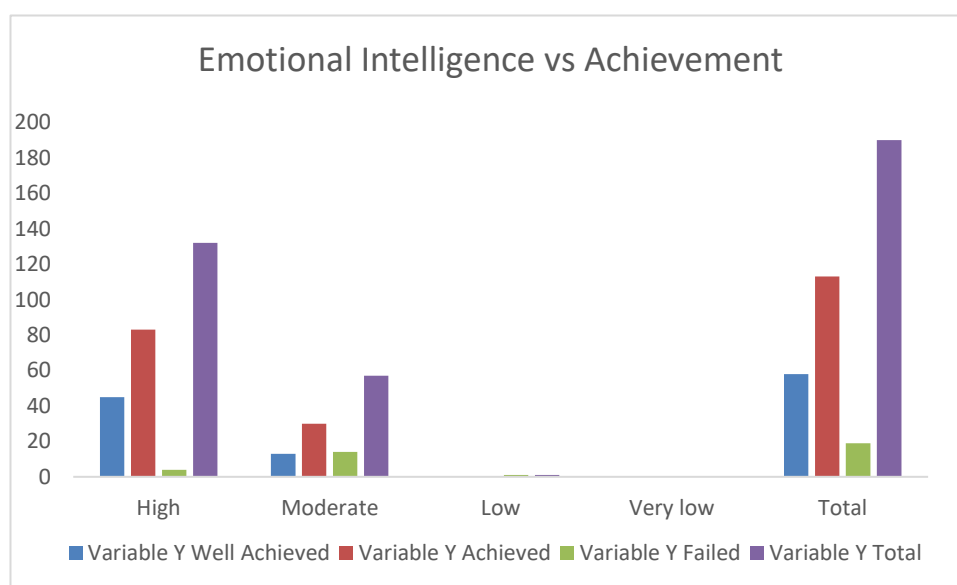


Fig. 1 - The relationship between emotional intelligence on Learning Achievement

Self-awareness of one's emotions, assets, and shortcomings are made possible by emotional intelligence (Ninivaggi, 2020). Students are better able to grasp their learning preferences, make achievable goals, and pinpoint areas for development because to this self-awareness. Additionally, emotional intelligence supports students' ability to control their emotions, handle stress, and maintain focus while learning. Students can improve their focus, motivation, and overall involvement, which will improve their academic performance, by being aware of and properly managing their emotions (Bansal, 2021). Interpersonal abilities like empathy, communication, and teamwork are all included in emotional intelligence. In educational settings, these abilities are crucial for productive teamwork and social interaction (Suhaimi et al., 2014). High emotional intelligence students are able to comprehend and relate to the feelings of their peers, teachers, and other participants in the educational process. Through group work, conversations, and cooperative problem-solving, this understanding develops positive relationships, cooperation, and effective communication, all of which can improve learning experiences and outcomes. According to (Tam et al., 2021) emotional intelligence helps students stay motivated and persistent in their academic endeavors. High emotional intelligence students are better able to make meaningful objectives, maintain motivation, and persevere in the face of difficulties. They are more resilient, better able to recover from failures, and keep a positive outlook on learning. Students that are emotionally intelligent embrace a growth attitude, embrace a love of learning, and see obstacles as chances for progress, which ultimately improves learning outcomes (ALmegeewly et al., 2022).

According to (Martínez-Monteagudo et al., 2019) emotional intelligence has an impact on students' capacity to control their emotions, particularly unpleasant feelings like tension, anxiety, and impatience. Memory, attention, and information processing are all positively impacted by effective emotional management. Positive emotions are more likely to be less disruptive for students who can effectively manage their emotions, allowing them to concentrate their cognitive resources on the current learning task. This improved cognitive functioning may result in better knowledge retention, application, and comprehension, which will raise learning achievement. Students' general wellbeing is influenced by their emotional intelligence, and this in turn has an impact on how well they study. Learning environments are more beneficial when students have better emotional intelligence since they

often feel less stress, anxiety, and emotional suffering (Sambol et al., 2022). The best learning conditions are fostered by a supportive and emotionally secure setting, which enables students to take intellectual risks, participate actively, and explore their potential. Students are more likely to prosper academically and produce better learning results when they feel safe, respected, and appreciated (Schonert-Reichl, 2023). In addition to other elements influencing learning accomplishment, such as cognitive abilities, instructional methodologies, and educational resources, emotional intelligence should be considered. However, a more all-encompassing approach to education can be created by recognizing and promoting emotional intelligence, which will favorably affect students' motivation, engagement, and general learning success.

4. Conclusion

According to the data analysis findings, emotional intelligence and self-concept generally had a high level of influence, whereas critical thinking skills variables had a moderate level of influence. The lowest score, with a physics learning accomplishment of 0.121, is emotional intelligence, according to the results of hypothesis testing. The success of learning physics is significantly influenced by emotional intelligence. Students who scored higher on emotional intelligence showed improved performance and results in their physics classes. There are a number of reasons why emotional intelligence and physics learning success are positively correlated. Enhancing self-awareness, self-regulation, motivation, and interpersonal skills are all benefits of emotional intelligence that make learning more efficient and interesting. In order to better learn and apply physics topics, students with higher emotional intelligence had a greater capacity to control their emotions, maintain focus, and persevere through difficulties. Students' collaboration abilities were also enhanced by emotional intelligence, enabling for efficient teamwork, communication, and problem-solving in physics-related tasks and projects. The results of this study highlight how crucial it is for physics education programs to take emotional intelligence into account. Including techniques that encourage emotional intelligence can improve students' learning outcomes and their entire experience in physics. Based on these findings, it is advised that high school students' emotional intelligence development be given priority by educational institutions and policymakers in Palu, Central Sulawesi, Indonesia. Giving students the chance to develop their self-awareness, emotional control, and interpersonal skills can boost their academic performance and learning outcomes in physics. It is suggested to conduct more research to examine additional variables, such as teaching strategies, curriculum design, and cultural contexts unique to Palu, Central Sulawesi, Indonesia, that may have an impact on the association between emotional intelligence and learning achievement in physics. Teachers and other stakeholders may foster a supportive and empowering learning environment that improves students' engagement, motivation, and ultimately their accomplishment in learning physics by recognizing and addressing the significance of emotional intelligence in physics education.

Acknowledgements

The author would like to thank the students, principals, and teachers of SMA Palu who have participated in the research.

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