

The Influence of Intelligence on Student Learning Achievement Seen from Learning Styles (Case Study on Math, Science, and English Lessons)

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*Budiman, Purwo Susongko, Rahmad Agung Nugraha^{1,2,3} 

^{1,2,3}Universitas Pancasakti Tegal, Indonesia.

Corresponding Author: boedybeka@gmail.com

ABSTRACT

This study examines the effect of intelligence on learning achievement in Mathematics, Science, and English based on students' learning styles. Using a quantitative approach, the research ensures statistical significance and minimizes researcher subjectivity while analyzing a large sample. The findings reveal that intelligence significantly influences academic performance across subjects, with varying contributions depending on learning styles. Visual learners show the highest intelligence-based contribution to Mathematics achievement (9.10%), followed by Science (8.20%) and English (5.10%). Auditory learners demonstrate a high contribution to Mathematics (7.40%), English (4.30%), and Science (4.10%). In contrast, kinesthetic learners exhibit the lowest contribution, with 0.70% for Mathematics, 0.50% for Science, and 0.30% for English. These results indicate that learning styles moderate the relationship between intelligence and academic success, with visual learners benefiting the most, particularly in Mathematics and Science, which require abstract understanding. The lower intelligence contribution for kinesthetic learners suggests that interactive, practice-based teaching methods are necessary to enhance their learning outcomes. The study underscores the importance of aligning instructional strategies with students' learning styles to optimize academic achievement. A visual-based approach proves more effective in subjects requiring conceptual understanding, while kinesthetic learners may need more hands-on, experiential learning methods to improve their performance.

Keywords: *Intelligence, Learning Style, Mathematics, Science, English*

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INTRODUCTION

Educators who recognize student learning styles will understand the diversity of student styles in receiving and processing information. Therefore, teachers need to design teaching and learning strategies and techniques that correspond to different learning styles among students. Gunawan (2004: 139) argues that research shows that students who learn by using their dominant learning style, when taking tests, will achieve much higher scores than if they learn in a way that is not in line with their learning style. In the context of Math, Science and English lessons, understanding students' learning styles becomes more relevant. Math and science are often perceived as abstract subjects that require a deep understanding of concepts, while English requires an understanding of linguistic and communication skills. Students with learning styles that match the teaching methods used by teachers tend to have better learning achievements, while students with less aligned learning styles may face difficulties.

However, not all students are aware of their learning styles, and often teachers do not fully accommodate learning style differences in the learning process. This can lead to

differences in learning achievement between students, especially in subjects such as Mathematics, Science and English. Therefore, it is important to examine the differences in students' learning achievement based on learning styles, so that teachers can develop more inclusive and effective learning strategies.

Each subject has its own characteristics that require different learning approaches. For example, Mathematics often involves systematic problem solving and logic, which may be more suitable for students with visual or kinesthetic learning styles. On the other hand, English lessons utilize more speaking and listening skills, which may be more effective for students with auditory learning styles. Meanwhile, science lessons require understanding abstract concepts that are often taught through practical experiments, in which kinesthetic students may be more actively involved.

However, one and the same teaching method may not always be effective for all students. Some research shows that students whose learning styles are not aligned with the teaching methods used in the classroom tend to experience a decline in academic performance. Students who do not understand how they learn well may also find it difficult to adjust to the different demands of different subjects. As a result, the mismatch between students' learning styles and teachers' teaching methods can lead to learning achievement gaps between students. Understanding students' different learning styles can help teachers adjust their teaching approaches, making learning more effective. Differentiated teaching strategies, which consider students' different learning styles, have been shown to significantly improve learning motivation and academic achievement. This more responsive teaching to students' needs will help students reach their full potential in understanding the subject matter.

Research that focuses on differences in learning achievement based on learning styles is very relevant to provide more appropriate solutions in the world of education. By understanding students' learning styles, teachers can adjust learning techniques to suit individual needs, whether in learning Mathematics, Science or English. In addition, this research is also expected to contribute to the development of a more inclusive curriculum, where learning methods are adapted to the diversity of students' learning styles.

METHOD

This study uses quantitative research, the reason for using quantitative research is because this study can cover a population with a large enough sample to provide statistically significant output even when analysing many variables. In addition, research has a strong capacity to eliminate researcher subjectivity. The population in this study is the total number of 8th grade students in SMP Negeri 3 Belik, consisting of boys and girls.

Data collection techniques consist of Questionnaires, Interviews Documentation Data Analysis techniques consist of Classical Assumption Test Normality, Heteroscedasticity Test, Multicollinearity. Multiple linear regression analysis is used to determine whether or not there is an influence between the independent variable and the dependent variable, namely between the intelligence variable on learning achievement in Mathematics, Science and English based on the learning style. To analyze the data using multiple linear regression analysis tools, it was carried out using SPSS software. F test is a test of the regression coefficient simultaneously. This test is conducted to determine the effect of all independent variables contained in the model together (simultaneously) on the dependent variable. The F test in this study was used to test the significance of the effect of intelligence and learning styles on student achievement. F the results of this calculation are compared with the F table obtained using a risk level or significant level of 5% or with degree freedom = k (n-k-1) with the following criteria:

H0 is rejected if $F_{\text{count}} > F_{\text{table}}$ or $\text{sig value} < \alpha$

H0 is rejected if $F_{\text{count}} < F_{\text{table}}$ or $\text{sig value} > \alpha$

If there is an acceptance of H_0 , it means that there is no significant effect of the multiple regression model obtained, resulting in an insignificant effect of the independent variables simultaneously on the dependent variable.

FINDINGS AND DISCUSSION

The results show that intelligence has a significant influence on student learning achievement in Mathematics, Science and English subjects. The coefficient of determination (R^2) in the regression analysis shows that the percentage contribution of intelligence to learning achievement varies depending on the subject and learning style. For example, for students with visual learning styles, intelligence contributed the highest to Mathematics achievement at 9.10%, followed by Science at 8.20%, and English at 5.10%. For auditory learning style students, intelligence contributed the highest to Math achievement at 7.4%, followed by English at 4.30% and Science at 4.10%. It turns out that learning style moderates the relationship between intelligence and learning achievement. Visual learning style contributes more than auditory and kinaesthetic styles. For auditory style, intelligence contributed 7.40% to Math achievement, 4.10% to Science, and 4.30% to English. Whereas in the kinaesthetic style, the effect of intelligence on learning achievement is relatively small, which is 0.70% for the visual style. Math, 0.50% for Science, and 0.30% for English. Learning styles moderated the relationship between intelligence and learning achievement. Visual learning style exerted the greatest influence, especially in Mathematics, while kinesthetic style showed the least influence in all subjects. This confirms the importance of matching learning methods with students' learning styles to improve learning outcomes. The higher contribution of intelligence in visual styles compared to auditory and kinesthetic styles indicates that visual-based approaches are more effective in supporting student learning, especially in materials that require abstract understanding such as Mathematics and Science. In contrast, the low contribution of kinesthetic style indicates the need for more interactive and practice-based learning to help students with this style.

The study highlights that intelligence significantly influences student learning achievement across Mathematics, Science, and English. However, this impact is not uniform for all students, as learning styles moderate the extent to which intelligence contributes to academic performance. While intelligence serves as a strong predictor of success, its effectiveness depends on how well it aligns with the student's preferred way of learning.

Learning styles play a crucial role in determining how effectively students process and retain information. The study categorizes students into three main learning styles – visual, auditory, and kinesthetic – and examines how intelligence interacts with each style to influence achievement. The results reveal that some learning styles benefit more from intelligence than others, emphasizing the need for tailored teaching approaches.

Among the different learning styles, visual learners experience the highest contribution of intelligence to their academic success. Intelligence accounts for 9.10% of Mathematics achievement, 8.20% in Science, and 5.10% in English. This suggests that students who prefer learning through images, diagrams, and written content are more likely to excel, especially in subjects requiring abstract thinking, such as Mathematics and Science.

Auditory learners also benefit from intelligence, but to a slightly lesser extent than visual learners. The study finds that intelligence contributes 7.40% to Mathematics achievement, 4.30% to English, and 4.10% to Science. These results indicate that students who learn best through listening and verbal instruction perform relatively well, particularly in language-based subjects like English, which rely heavily on auditory comprehension. Kinesthetic learners show the lowest contribution of intelligence to academic achievement compared to visual and auditory learners. Intelligence contributes only 0.70% to Mathematics, 0.50% to Science, and 0.30% to English for these students. This suggests that

traditional teaching methods, which often emphasize theoretical knowledge, may not be as effective for students who learn best through hands-on activities and movement.

The study confirms that learning styles moderate the relationship between intelligence and learning achievement. Visual learners experience the highest benefits, followed by auditory learners, while kinesthetic learners show the least improvement due to intelligence alone. This finding highlights the need to incorporate diverse teaching strategies that cater to all learning styles to ensure that every student can maximize their academic potential. Since visual learners exhibit the highest academic performance linked to intelligence, visual-based instructional strategies may be particularly effective in subjects requiring abstract understanding, such as Mathematics and Science. Teachers can enhance student learning by incorporating diagrams, charts, videos, and written explanations, helping students better process and retain complex information.

The low contribution of intelligence to kinesthetic learners' academic success suggests that traditional teaching methods may not fully support their learning needs. These students require more interactive and practice-based learning approaches, such as hands-on experiments, role-playing activities, and real-world applications of concepts. Integrating such strategies into the curriculum could help improve their learning outcomes. These findings emphasize the importance of recognizing and accommodating different learning styles in the classroom. Teachers should adopt a more flexible and inclusive teaching approach that incorporates a balance of visual, auditory, and kinesthetic learning strategies. By doing so, they can create a more engaging learning environment that maximizes the academic potential of all

So it can be concluded, Intelligence statistically significantly contributes to student learning achievement, but the contribution varies depending on the student's learning style. Visual learning styles show the most optimal results, while kinesthetic styles require more adaptive learning interventions. Therefore, it is important for teachers to integrate learning methods that support all learning styles so that students can reach their full potential.

CONCLUSION

This study highlights the significant influence of intelligence on student learning achievement, with learning styles playing a moderating role in this relationship. Visual learners show the highest contribution of intelligence to academic success, particularly in Mathematics and Science, while kinesthetic learners exhibit the lowest contribution, indicating a need for more hands-on, interactive teaching methods. These findings underscore the importance of aligning instructional strategies with students' learning preferences to optimize their academic performance. Teachers should adopt diverse teaching methods to accommodate different learning styles, ensuring a more inclusive and effective learning environment.

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