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Correlation of IQ and multiple intelligence on educational psychology learning outcomes

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Abstract

This study aims to analyze the relationship between the level of IQ (Intelligence Quotient) and the dominance of Multiple Intelligence on student learning outcomes in educational psychology courses at the PGSD department of UNU Yogyakarta. Using a quantitative approach with a correlational design, this study involved 46 students using simple random sampling technique. Data were collected through questionnaires measuring IQ variables, multiple intelligences, and learning outcomes. The results of the analysis using the Pearson correlation test show that there is a positive and significant relationship between IQ and learning outcomes, with a correlation value of 0.873 (87.3%), which indicates that the higher the IQ score, the higher the learning outcomes obtained by students. The normality test shows that the residual data meets the assumption of normality with an Asymp. Sig. (2-tailed) of 0.126, which is greater than 0.05, indicating that the regression model used is valid. This study confirms that IQ serves as an important predictor of academic success, and an understanding of multiple intelligences can help in designing more effective learning strategies. The implications of this study show the importance of an inclusive educational approach, which considers different types of intelligence to support students' holistic development. This research is expected to provide insights for educators in creating learning environments that are more adaptive and responsive to students' needs

Keywords: *IQ, Multiple Intelligence, Learning Outcome*

Introduction

Educational psychology is a specialized branch of psychology that focuses on understanding how individuals learn and develop in educational settings. This field covers a wide range of topics, including cognitive processes, emotional factors, social interactions, and the impact of the environmental context on learning outcomes. The aim of this field is to apply psychological principles to improve educational practices, thereby enhancing student learning and development. As noted by Telyani et al., educational psychology addresses various aspects of learning, including motivation and engagement, which are crucial for academic success (Telyani et al., 2021). This discipline not only examines the cognitive dimensions of learning but also emphasizes the importance of emotional and

social factors that influence students' educational experiences (de la Fuente et al., 2021). Purwanto and Wangid emphasize that understanding students' psychological characteristics is essential for improving the quality of learning and ensuring that educational practices are effective and responsive to students' needs (Purwanto & Nur Wangid, 2022). Educational psychology plays a vital role in the field of education to support learning that aligns with students' needs.

Educational psychology is guided by culture, reflecting the interdisciplinary nature of the field. Educational psychology acknowledges that educational practices must be sensitive to the cultural context in which they are implemented. Marsico and Dazzani emphasize that education is fundamentally cultural, and understanding this cultural dimension is crucial for effectively applying psychological principles in diverse educational settings (Giuseppina Marsico1, 2022). This cultural perspective not only enhances the relevance of educational psychology but also promotes inclusivity and equity in educational practice, ensuring that all students have the opportunity to succeed. Practices in learning can be measured by the learning outcomes achieved by students. Learning outcomes serve as important indicators of educational effectiveness, reflecting the extent to which students have acquired knowledge, skills, and competencies after participating in learning activities. Learning outcomes provide a framework for assessing student performance and understanding the impact of various teaching methodologies on learning. Learning outcomes not only encompass cognitive achievements but also the development of attitudes and skills, which are crucial for holistic education (Tenti et al., 2021). Students' learning outcomes serve as a benchmark for success in terms of the understanding gained during the learning process. Therefore, identifying the factors that influence these outcomes, such as intellectual and psychological capabilities, is essential for improving educational effectiveness and fostering student growth

The importance of learning outcomes goes beyond academic achievement. Learning outcomes play a crucial role in shaping students' educational and career paths in the future. Engaging students in relevant and engaging content can significantly enhance their learning outcomes (Brandi Rima, 2021). Numerous factors influence students' learning outcomes, including IQ and multiple intelligences. Simply put, IQ has been viewed as a predictor of academic success that influences students' learning outcomes (Mulyani & Lubis, 2024).

IQ (Intelligence Quotient) serves as a widely recognized measure of cognitive ability, reflecting an individual's capacity to learn, reason, and solve problems. Recent studies reveal that students with higher IQ scores tend to complete more years of education. This relationship underscores the dynamic interaction between education and cognitive ability, suggesting that educational experiences can enhance cognitive skills, thereby positively influencing IQ scores (Archer, 2022). Individuals with higher IQs often engage more in cognitively stimulating activities, thereby increasing their cognitive resilience over time. These findings indicate that IQ is not merely a static measure but is influenced by lifelong learning and experience (Alty et al., 2023). Research conducted by Schilder found that intelligence accounts for the majority of variance in educational achievement among adolescents, reinforcing the notion that cognitive ability is an important predictor of academic success (Schilder et al., 2021). This means that IQ serves as a fairly accurate measure for assessing students' cognitive intelligence, as evidenced by attitudes and behaviors that are more prominent than those of their peers. Like IQ, multiple intelligence, also popularly known as multiple intelligences (MI), is also used to determine students' learning styles during the learning process.

The theory of multiple intelligences emphasizes the importance of recognizing and nurturing diverse intellectual strengths in educational settings, thereby promoting a more inclusive approach to teaching and learning (Al-Qatawneh et al., 2021). Howard Gardner identified eight distinct types of intelligence: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic (Jia et al., 2022). Recent research conducted by Ahmad shows that integrating the principles of multiple intelligences into language teaching can significantly improve students' language acquisition and retention (Ahmad, 2022). Applying this approach not only supports academic achievement but also contributes to students' holistic development by fostering self-awareness and confidence in their abilities (Arshy Prodyanatasari., Mustofa Aji Prayitno., 2023).

Based on the theoretical exposition and research results that have been conducted, it can be explained that

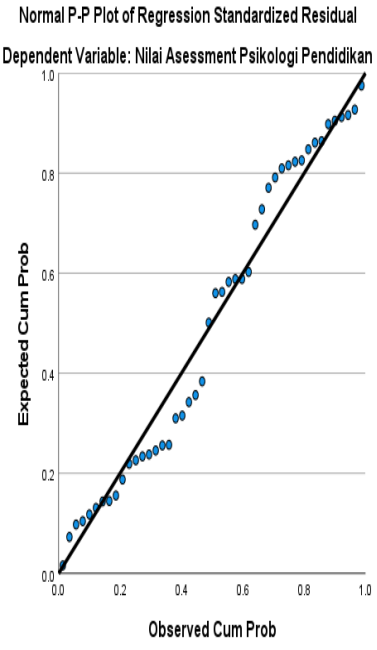
IQ is a measure of intelligence and cognitive success of students during learning and is also supported by multiple intelligences as an approach used to support students' holistic development. Therefore, as a follow-up to this research, it will reveal the relationship between IQ levels and Multiple Intelligence Dominance on educational psychology learning outcomes in students.

Method

This study uses a quantitative approach with a correlational design. Correlational research is a study to determine the relationship and degree of relationship between two or more variables without any attempt to influence those variables (Aurana Zahro El Hasbi, 2023). The data collection method in this study used a questionnaire given to 46 students majoring in PGSD at UNU Yogyakarta. The sampling technique used was simple random sampling, selected at random (Estiningtyas et al., 2024). The questionnaire consisted of questions from variable X1 regarding IQ and questions from variable X2 regarding multiple intelligences. Meanwhile, variable Y used data on students' academic performance in the educational psychology course. Data analysis was conducted using Pearson's correlation test. This test was chosen because it is suitable for measuring the strength and direction of the linear relationship between two continuous variables, allowing for a clear interpretation of how strongly IQ and multiple intelligence are associated with learning outcomes. This correlation test is one of the statistical measures used to assess the strength and direction of the linear relationship between two variables being tested (Darrel Athaya Refaldi, Achmad Faiz, Malvin Reynara Jawakory, Nur Aini Rakhmawati, 2024). In this case, the test is used to determine the relationship between IQ (Intelligence Quotient) and Multiple Intelligence dominance on student learning outcomes in the educational psychology course.

Results and Discussion

Table 1. Residual normality test



Based on the normality test, the residual data in the regression model meets the normality assumption. The points in the graph follow a diagonal line. This indicates that the residuals have a distribution that is close to normal. Thus, the regression analysis results can be considered valid and the statistical assumptions underlying the model are met.

Table 2. One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			46
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		4.42723962
Most Extreme Differences	Absolute		.117
	Positive		.117
	Negative		-.102
Test Statistic			.117
Asymp. Sig. (2-tailed)[c]			.126
Monte Carlo Sig. (2-tailed)[d]	Sig.		.109
	99% Confidence Interval	Lower Bound	.101
		Upper Bound	.117

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 299883525.

Based on the Kolmogorov-Smirnov normality test table, the Asymp. Sig. (2-tailed) value is 0.126. Since the value is > 0.05, the normality assumption is not rejected, meaning that the residuals are close to a normal distribution. Additionally, based on the Monte Carlo Sig. (2-tailed) value of 0.109, this further supports the conclusion that the data is normally distributed at a significance level of 5%.

Table 3. Pearson correlation test of IQ scores and psychology learning outcomes

		Nilai IQ	Nilai Asessment Psikologi Pendidikan
Nilai IQ	Pearson Correlation	1	.873**
	Sig. (2-tailed)		.000
	N	46	46
Nilai Asessment Psikologi Pendidikan	Pearson Correlation	.873**	1
	Sig. (2-tailed)	.000	
	N	46	46

**. Correlation is significant at the 0.01 level (2-tailed).

Based on the correlation test table between X1 and Y, a correlation value of 0.873 or 87.3% was obtained, which means that the higher the IQ value, the higher the educational psychology score obtained. Additionally, the Sig. (2-tailed) value is 0.000. This value is smaller than the significance level of 0.01 (1%), so the correlation result is highly statistically significant. These findings are consistent with existing literature that positions IQ as

a strong predictor of cognitive performance, particularly in structured academic environments where analytical and logical reasoning are prioritized.

Table 4. Pearson correlation test of Multiple Intelligence scores and psychology learning outcomes

		Nilai Multiple Intelegence	Nilai Asessment Psikologi Pendidikan
Nilai Multiple Intelegence	Pearson Correlation	1	.011
	Sig. (2-tailed)		.941
	N	46	46
Nilai Asessment Psikologi Pendidikan	Pearson Correlation	.011	1
	Sig. (2-tailed)	.941	
	N	46	46

Berdasarkan tabel uji korelasi antara X2 terhadap Y, maka didapatkan nilai korelasi sebesar 0,011 atau 1,1 %. Selain itu nilai Sig. (2-tailed) sebesar 0,941. Nilai ini lebih besar dari tingkat signifikansi 0.01 (1%), sehingga hasil korelasi tidak signifikan secara statistik.

Table 5. Model Summary

					Change Statistics			
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2
1	.873[a]	.763	.752	4.52903	.763	69.062	2	43

a. Predictors: (Constant), Nilai Multiple Intelegence, Nilai IQ

Based on the table, variables X1 and X2 simultaneously have a relationship with variable Y, as indicated by the sig F Change value of <0.001. The correlation is indicated by the R value of 0.873 or 87.3%, which shows the strength of the relationship between the independent variables (IQ score and Multiple Intelligence score) and the dependent variable (Educational Psychology Assessment score). These values indicate a very strong and positive correlation.

The results of the study indicate that there is a relationship between IQ, multiple intelligences, and learning outcomes. Student learning outcomes are an important indicator in assessing the effectiveness of the educational process. Various factors influence learning outcomes, including IQ (Intelligence Quotient) and multiple intelligences. In the context of education, understanding these two concepts is very important for designing effective learning strategies.

1. Relationship between IQ (X1) and Learning Outcomes (Y)

   Based on the results of a study conducted on 46 students majoring in PGSD at UNU Yogyakarta, the Pearson correlation coefficient calculation revealed a positive and significant correlation between IQ (X1) and learning outcomes (Y). This is supported by research conducted by Amin, who noted that there is a positive and significant correlation between IQ and learning outcomes (Amin, 2021). Based on the Pearson correlation test table between X1 and Y, a correlation value of 0.873 or 87.3% was obtained, meaning that the higher the IQ score, the higher the educational psychology score obtained. This means that someone with a high level of intelligence generally finds it easier to learn and tends to achieve better results.

IQ is often considered a measure of cognitive ability that can predict academic success. A study shows that students with higher IQ scores tend to have better learning outcomes (Hendriyanto & Juandi, 2022). This is due to better cognitive abilities in processing information, reasoning, and problem-solving. A study that has been conducted confirms that a good educational experience can improve cognitive skills. Thus, there is a dynamic interaction between education and cognitive abilities that educators need to pay attention to (J Isohatala, P Naykki, 2020).

2. Relationship between Multiple Intelligence (X2) and Learning Outcomes (Y)

Based on the results of a study conducted on 46 PGSD UNU Yogyakarta students, the Pearson correlation calculation results concluded that there is a positive but insignificant relationship or correlation between Multiple Intelligence (X2) and learning outcomes (Y). This is supported by a previous study by Rofifah, which stated that there is a positive and significant correlation between Multiple Intelligence and learning outcomes (Rofifah & Aflah, 2023). Based on the correlation test table between X2 and Y, the correlation value obtained was 0.011 or 1.1%. Additionally, the Sig. (2-tailed) value is 0.941. This value is greater than the significance level of 0.01 (1%), so the correlation result is not statistically significant. This means that someone with a certain level of multiple intelligence tendency influences learning outcomes. However, this influence might not be as directly measurable as IQ, due to the broader and more diverse nature of multiple intelligences, which often manifest in non-academic domains such as artistic, musical, or interpersonal abilities

The theory of multiple intelligences provides a useful framework for understanding how students learn and interact with subject matter. Research conducted by Anggraini shows that integrating the principles of multiple intelligences into teaching can improve students' language acquisition and retention. This approach not only supports academic achievement but also contributes to students' holistic development by fostering self-awareness and confidence in their abilities. By applying this approach, learning becomes more effective and aligned with the learning objectives that must be achieved (Anggraini et al., 2021).

Multiple intelligences also play a role in increasing student motivation. When students feel that their intelligence is recognized and valued, they tend to be more engaged in the learning process. This is in line with the findings of Telyani et al. (2021), which emphasize the importance of motivation and engagement in academic success. By creating a learning environment that supports various types of intelligence, educators can significantly improve student learning outcomes.

3. The relationship between IQ and Multiple Intelligence on learning outcomes

Based on the results of the study using Pearson's correlation test, it was concluded that simultaneously variables X1 and X2 are related to variable Y, as indicated by the sig F Change value of <0.001. The correlation strength is indicated by the R value of 0.873, or 87.3%, which shows the strength of the relationship between the independent variables (IQ scores and Multiple Intelligence scores) and the dependent variable (Psychological Education Assessment scores). This value indicates a very strong and positive correlation. These results are supported by the findings of a study conducted by Lestari et al., which stated that there is a positive influence between IQ and mathematics learning outcomes among students in Serang City, amounting to 11.9% (A. Lestari et al., 2021). In line with the research conducted by Amelia et al., it is stated that IQ and Multiple Intelligence have significant implications for the teaching and learning process. This is because both have the potential to develop students' intelligence comprehensively (Amelia et al., 2022).

The findings of this study, indicating a positive and significant correlation between IQ and learning outcomes , as well as a positive but statistically insignificant correlation between multiple intelligences and learning outcomes, carry profound conceptual and practical implications for the field of educational psychology and teaching practices. Conceptually, these results reinforce the view that IQ, as a measure of general cognitive ability, remains a strong predictor of academic success within formal learning contexts that demand analytical reasoning and problem-solving. This aligns with research by Schilder et al. (2021) which found that intelligence accounts for the majority of variance in educational achievement among adolescents. This interconnectedness suggests that interventions aimed at developing core cognitive abilities,

such as logical reasoning and information processing, can directly contribute to improving student learning outcomes. This implication encourages educators to continue focusing on the development of fundamental cognitive skills through teaching methods that stimulate critical and analytical thinking.

However, it is crucial to note that while the IQ correlation is very strong, it does not explain 100% of the variance in learning outcomes. This suggests the presence of other contributing factors, including aspects covered by the theory of multiple intelligences. Although this study found that multiple intelligences individually did not correlate statistically significantly with learning outcomes in the educational psychology course, this does not necessarily diminish their role. Instead, it may indicate the complexity of measuring and manifesting multiple intelligences within specific academic contexts. Multiple intelligences often manifest in non-academic domains or in the form of more subtle talents and learning preferences that may not be directly reflected in standardized test scores. For example, students with high bodily-kinesthetic intelligence might excel in project-based learning or simulations, even if this is not always directly measurable in written educational psychology tests.

Practically, these findings underscore the need for a holistic and inclusive educational approach. This approach not only focuses on IQ development through cognitively challenging curricula but also recognizes and utilizes the diverse intelligences that students possess. If IQ is about "what" is learned (cognitive capacity), then multiple intelligences can be seen as "how" students most effectively learn and express their understanding. Therefore, teaching strategies should be designed to accommodate different learning styles associated with various types of intelligence. For instance, a student with linguistic intelligence will respond well to discussions, essay writing, and reading, while a student with musical intelligence might grasp concepts better through rhythm or melody. Integrating various teaching methods that engage different intelligences can enhance student engagement and intrinsic motivation.

Furthermore, the implication for educators is the importance of diverse assessment. In addition to standardized tests that measure general cognitive abilities (IQ), educators should also consider using formative and summative assessment methods that allow students to demonstrate their understanding through various modalities corresponding to their dominant intelligences. This could include creative projects, oral presentations, performances, or even portfolios that reflect various types of skills. Such assessments not only provide a more comprehensive picture of student abilities but also boost student confidence by valuing their unique strengths.

Additionally, these findings also highlight the importance of professional development for teachers. Educators need to be equipped with the knowledge and skills to identify multiple intelligences in their students and implement relevant teaching strategies. Training on multiple intelligences theory and how to integrate it into classroom practice can help teachers create a more adaptive and responsive learning environment for individual student needs. This also aligns with the views of Purwanto and Wangid (2022), who emphasize that understanding students' psychological characteristics is essential for improving the quality of learning. Thus, education must move beyond a "one-size-fits-all" paradigm and embrace the diversity of intelligences present in every classroom.

4. Factors Affecting Learning Outcomes

In addition to IQ and multiple intelligences, there are various other factors that affect student learning outcomes, including student character, motivation, attitude toward learning, concentration, and self-confidence, to name a few (A. Lestari et al., 2021). Research indicates that students with high motivation and a positive attitude toward learning tend to achieve better learning outcomes. Therefore, it is important for educators to create a supportive and motivating learning environment. The curriculum and school facilities also play an important role in determining learning outcomes. A relevant and interesting curriculum can increase student engagement, while adequate facilities can support an effective learning process (Amin, 2021). In this context, educators need to consider various aspects that can influence the learning experience of students, ranging from equipment inside the classroom to outside the classroom.

5. Implications for Educational Practice

Based on the above discussion, there are several important implications for educational practice. First, educators need to understand that each student has different intelligences. Thus, a one-size-fits-all teaching approach will not be effective. Instead, educators should design diverse teaching methods that are tailored to students' multiple intelligences. Second, it is important to integrate teaching that supports the development of students' cognitive and emotional skills. An approach that emphasizes the development of emotional intelligence can help students manage their emotions, which in turn can increase their motivation and engagement in the learning process. Third, educators must create a positive and supportive learning environment. A safe and inclusive environment can boost students' self-confidence and encourage them to actively participate in the learning process. This aligns with research by Purwanto and Wangid, which emphasizes the importance of understanding students' psychological characteristics to improve the quality of learning (Purwanto & Nur Wangid, 2022).

By integrating both cognitive and non-cognitive intelligence assessments in the classroom, educators can better tailor instructional strategies that align with students' individual strengths in conclusion, the relationship between IQ, multiple intelligences, and learning outcomes is complex and influenced by various factors. While IQ can be a predictor of academic success, multiple intelligences offer a more holistic perspective on students' abilities. Therefore, it is important for educators to understand and apply the principles of multiple intelligences in their educational practices. As a result, it is hoped that students' learning outcomes can be significantly improved, and they can develop into competent and confident individuals.

Conclusion

This study emphasizes the importance of a holistic approach in understanding human intelligence, including intellectual intelligence and multiple intelligences. Based on the findings, intellectual intelligence significantly contributes to analytical, logical, and problem-solving abilities, while multiple intelligences enrich individuals' abilities through various dimensions such as linguistic, musical, kinesthetic, interpersonal, and others. These two aspects complement each other in developing well-rounded and adaptive individuals in various contexts of life. Therefore, it is important for educators to understand students' psychological characteristics and apply appropriate teaching methods to enhance students' motivation and engagement in the learning process. This research provides valuable insights for developing more effective and adaptive educational practices, encouraging students to develop into competent and confident individuals. The integration of IQ and Multiple Intelligence is important to implement, especially in the field of education, so that students can develop optimally according to their potential and learning styles. Further research can be directed toward exploring practical strategies for integrating intellectual and multiple intelligences into the educational curriculum.

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