

Integrating intellectual, emotional, and spiritual intelligence to enhance academic achievement in pencak silat

Rony Mohamad Rizal^{1abcde,*} , Akhmad Sobarna^{1acde} ,
Ediansyah^{1abcd} , & Joni Alpen^{2acd} 

Sekolah Tinggi Keguruan dan Ilmu Pendidikan Pasundan, Indonesia¹
Universitas Islam Riau, Indonesia²

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ABSTRACT

Background Problems: Intellectual, emotional, and spiritual intelligences are believed to influence student learning achievement. However, the specific impact of these intelligences on physical education and, more specifically, on pencak silat learning outcomes remains unexplored. **Research Objective:** The purpose of this study was to determine the effect of intellectual, emotional, and spiritual intelligence on students' learning achievement in pencak silat. **Methods:** This research method uses descriptive quantitative causality. We sampled 96 students from a high school in Bekasi City. This study used four instruments: (i) Sternberg triarchic abilities test, (ii) global emotional intelligence test, (iii) spiritual intelligence test, and (iv) pencak silat learning achievement using Bloom's taxonomy. We analysed the data using descriptive statistics, specifically the F-test and T-test. **Findings and Results:** The study revealed that intellectual, spiritual, and emotional intelligence all play a significant role in enhancing students' learning achievement in pencak silat within physical education settings. Among these, emotional intelligence emerged as the most influential factor, surpassing both intellectual and spiritual intelligence in its impact on academic success. This finding underscores the critical role of emotional regulation and awareness in mastering complex physical and mental skills in pencak silat. **Conclusions:** The findings highlight the importance of strengthening all aspects of intelligence in education. This research brings a fresh perspective to the field of physical education, highlighting the increasing prominence of emotional intelligence in learning outcomes. It demonstrates the need for the development of emotional intelligence in the context of physical education, particularly in relation to pencak silat. For a more comprehensive understanding, we can conduct further research to investigate the interaction of these intelligences with other variables such as motivation, learning environment, and teaching methods.

Keywords: Intellectual intelligence; emotional intelligence; spiritual intelligence; learning achievement



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Corresponding Author: Rony Mohamad Rizal, Master of Physical Education, Graduate Program, Sekolah Tinggi Keguruan dan Ilmu Pendidikan Pasundan, Cimahi, Indonesia.



denrony@gmail.com

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INTRODUCTION

One of the main goals of education is to develop the elements of intelligence, which consist of intellectual, emotional, and spiritual intelligence (Looney et al., 2024; Sharma & Shukla, 2023). Intelligence development begins with education in the family and community environment (Lestari et al., 2021). Education and learning in a school environment, which demands student grades as an evaluation of learning outcomes, complement this process over time (Sutar & Hariyanto, 2017; Rizal et al., 2020, 2021). Physical education is one of the many subjects that demand the development of intelligence (Arifin, 2017). Physical education is important for overall development and improving physical, mental, and social abilities (Hambali, 2018). High intellectual intelligence supports academic tasks (Rosita et al., 2015), while emotional intelligence supports social skills (Arafa et al., 2022; Saputri, 2018; Zhoc et al., 2020b, 2020a, 2023).

Spiritual intelligence is an innate capacity of individuals that emanates from their souls, enabling them to effectively navigate and adjust to their surroundings, resolve conflicts amicably, and derive wisdom from the challenges they encounter (Ashshidieqy, 2018). Spiritual intelligence refers to the ability to address issues related to their purpose and significance (Khosravi & Nikmanesh, 2014). It involves the capacity to situate activities and lives within a wider and more profound framework of meaning (Ahmadi et al., 2021). Additionally, it entails the ability to discern that one's acts or chosen way of life hold greater meaning than others (Basuki, 2015). Spiritual intelligence serves as the fundamental basis of intellectual and emotional intelligence. Spiritual intelligence is considered to be the most elevated form of intelligence (El et al., 2014).

Previous studies have extensively explored the role of intellectual, emotional, and spiritual intelligence in academic settings. For instance, Goleman (2020) highlighted the significant influence of emotional intelligence on students' engagement and academic performance, while Zohar and Marshal (2012) emphasised the role of spiritual intelligence in fostering a deeper understanding of oneself and life's broader meaning. Despite these contributions, the specific impact of these intelligences on physical education and, more specifically, on pencak silat learning outcomes remains underexplored. This study fills this gap by focussing on how intellectual, emotional, and spiritual intelligence collectively and individually influence learning achievements in pencak silat, thus offering new insights into the interdisciplinary connections between cognitive and physical education.

The difference between this study and the existing literature lies in the methodological approach, the instruments used, and the specific subject focus. Unlike previous studies that predominantly employed qualitative methods or focused on a single type of intelligence (Dooley et al., 2019; Lozano-Blasco et al., 2022; Ma & Wang, 2022), this study utilises a quantitative causality design to establish a causal relationship between multiple intelligences and learning outcomes. The use of the Sternberg Triarchic Abilities Test (STAT) for intellectual intelligence (Chooi et al., 2014), Goleman's Global Emotional Intelligence Test (Goleman, 2020), and Zohar and Marshal's criteria for spiritual intelligence provides a comprehensive assessment framework (Zohar & Marshal, 2012). Additionally, this study's focus on pencak silat, a culturally significant martial art, adds a unique dimension to the research, distinguishing it from studies conducted in other academic or physical education contexts.

The urgency of this research lies in its potential to inform and transform educational practices, particularly in physical education (Khairuddin et al., 2023). The purpose of this research is to understand the multifaceted impact of intellectual, emotional, and spiritual intelligence on learning outcomes to help educators develop more holistic teaching strategies that meet the diverse needs of students, especially on the topic of learning pencak silat, which is Indonesia's heritage to the world.

In the context of pencak silat, enhancing these intelligences can deepen students' appreciation and mastery of the martial art, contributing to the preservation and promotion of Indonesian cultural heritage. Furthermore, as emotional intelligence has been identified as the most significant predictor of academic success in this study, targeted interventions to improve students' emotional skills can lead to substantial improvements in their overall learning experience and performance (Quílez-Robres et al., 2023). This research, therefore, holds significant implications for educational policy and practice, advocating for a balanced approach that nurtures all aspects of student intelligence to achieve pencak silat learning outcomes.

METHOD

Type of Research

This research method employs descriptive quantitative causality to establish a causal connection between the independent and dependent variables (Apuke, 2017). Descriptive quantitative research focusses on quantifying relationships and patterns within a dataset (Creswell, 2018). It involves collecting numerical data and applying statistical techniques to test hypotheses and make prediction (Clark et al., 2021). The causality aspect indicates an interest in determining whether a change in one variable (the independent variable) directly influences a change in another variable (the dependent variable) (Field, 2021).

Participants

Employing a simple random sampling method (Noor et al., 2022), this study selected a sample of 96 students from the complete population of students at Senior High School in Bekasi City during the 2020-2021 academic years. There were 50 male students and 46 female students.

Instrument and Research Procedures

The intellectual intelligence indicators measured were practical, creative, and analytical abilities, as measured by the Sternberg Triarchic Abilities Test (STAT) (Chooi et al., 2014). The STAT is a multiple-choice test. The test consists of 36 items, categorised into nine distinct scales. These scales are Analytical-Verbal, Analytical-Quantitative, Analytical-Figural, Practical-Verbal, Practical-Quantitative, Practical-Figural, Creative-Verbal, Creative-Quantitative, and Creative-Figural. Each scale has four items. Analytical intelligence involves analysing, evaluating, judging, comparing, and contrasting information in an abstract manner (Chooi et al., 2014). Practical intelligence is about how well an individual deals with their environment. Creative intelligence assesses how well an individual copes with novelty. The STAT's scoring is based on the responses to the test items. Test each of the three aspects of intelligence using three modes of problem presentation: verbal, quantitative, and figural (Lacombe et al., 2022). All questions were declared valid with a significance value of < 0.05 and a reliability value of 89.3%.

Emotional intelligence (Goleman) includes indicators of self-awareness, self-management, social awareness, and relationship management (Goleman, 2020). The Global Emotional Intelligence Test, which is based on Goleman's model, uses 40 questions. The Global EI Capability Assessment instrument is the source of these questions. The Global Emotional Intelligence Test's scoring is based on the responses to the items in the test. After completing the test, the computer generates an EI profile of the scores. The interpretation of the scores involves understanding the individual's emotional strengths and weaknesses (Goleman, 2020). All questions were declared valid with a significance value of < 0.05 and a reliability value of 90%.

Spiritual Intelligence according to Zohar and Marshal (2012), the test evaluates attitudes and performance on twelve Spiritual Intelligence criteria. These factors indicate morality, values, open-mindedness, creativity, visionary leadership, critical thinking, reflective thinking, and intuition. Spiritual Intelligence scores are based on test answers. Score interpretation requires recognising spiritual strengths and weaknesses. This entails studying intelligence testing and its theory. Interpretation is possible only when a test score aligns with a meaningful construct. To measure pencak silat learning achievement using Bloom's taxonomy, which has been revised and adapted to the characteristics of pencak silat, which requires assessment of cognitive, affective, and psychomotor aspects (Stanny, 2016). All questions were declared valid with a significance value of < 0.05 and a reliability value of 89.8%.

Data Analysis

Testing the results of this study using multiple linear regression analysis is useful for predicting the influence of more than one independent variable on one dependent variable. The calculation results obtained using SPSS version 24 for windows.

RESULTS AND DISCUSSION

An illustration of the influence of intellectual, emotional, and spiritual intelligence on pencak silat learning achievement in physical education subjects at Senior High School can be seen from the results of the following data processing. The first step was testing the normality of the data. In this research, the Kolmogorov-Smirnov test was used at a significance level of $\alpha = 0.05$ using SPSS 24. Table 1 shows the results of the data normality test on the impact of intellectual, emotional, and spiritual intelligence on the learning achievement of pencak silat.

Based on the data obtained from the normality test calculations in Table 1, it can be seen that Asymp. signature. 2-tailed for each variable is intellectual intelligence 0.16, emotional intelligence 0.45, spiritual intelligence 0.19, and learning achievement of pencak silat 0.253. The significance value of the overall data on the impact of intellectual, emotional, and spiritual intelligence on the learning achievement of pencak silat is all greater than 0.05 (significance > 0.05), meaning that the overall data is normally distributed. The data distribution is clearly seen in Figure 1.

Table 1. One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		96
Normal Parameters ^{a,b}	Mean	0
	Std. Deviation	2.27079947
Most Extreme Differences	Absolute	0.09
	Positive	0.09
	Negative	-0.088
Test Statistic		0.09
Asymp. Sig. (2-tailed)		.055 ^c

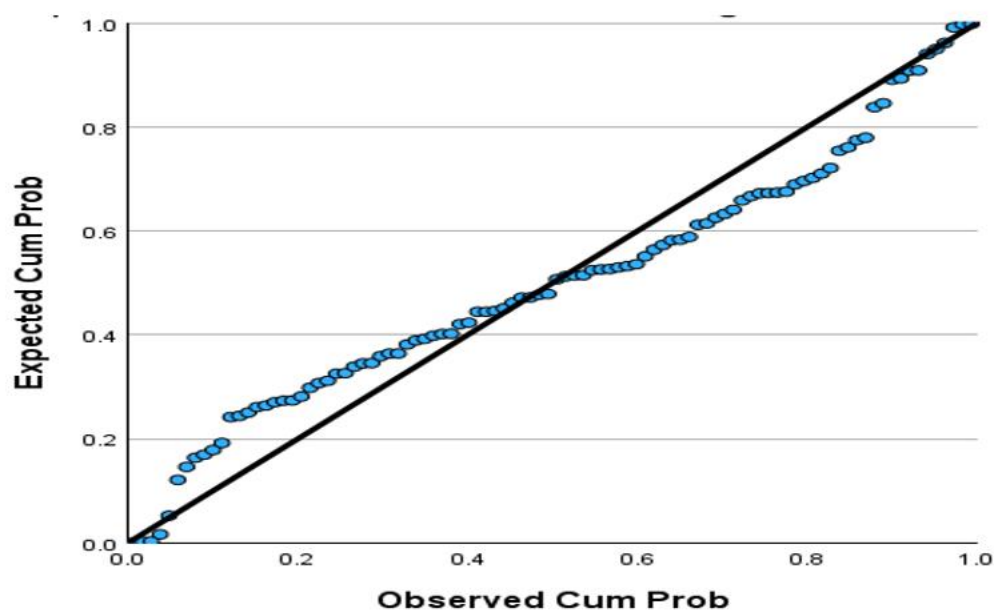


Figure 1. Normal P-P Plot of Regression Standardised Residual

After ensuring that the data was normally distributed, multiple linear regression analysis was then carried out with the results, which can be seen in Table 2.

Table 2. Multiple Linear Regression Analysis Coefficients^a

	Model	Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	-7.624	1.878
	Intellectual Intelligence	.315	.058
	Emotional Intelligence	.563	.054
	Spiritual Intelligence	.037	.015

Based on the table 2, the regression equation formed in this regression test is

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3$$

$$Y = -7.624 + 0.315X_1 + 0.563X_2 + 0.037X_3$$

This model can be interpreted as follows: a constant (a) of -7.624 means that if the independent variables Intellectual Intelligence (X_1), Emotional Intelligence (X_2), and Spiritual Intelligence (X_3) are constant, then the magnitude of the variable tied to Learning Achievement (Y) is -7.624. The regression coefficient (b_1) for intellectual intelligence (X_1) had a value of 0.315. This shows a unidirectional relationship between the variable Intellectual Intelligence (X_1) and Learning Achievement (Y), namely, if the percentage of the variable Intellectual Intelligence (X_1) increases by one unit, then Learning Achievement (Y) will increase by 0.315 units. The regression coefficient (b_2) for emotional intelligence (X_2) had a value of 0.563. This shows a unidirectional relationship between the variables of emotional intelligence (X_2) and learning achievement (Y); that is, if the percentage of emotional intelligence (X_2) increases by one unit, then learning achievement (Y) decreases by 0.563 units. The regression coefficient (b_3) for spiritual intelligence (X_3) has a value of 0.037. This shows a unidirectional relationship between the variable Spiritual Intelligence (X_3) and Learning Achievement (Y); namely, if the percentage of the variable Spiritual Intelligence (X_3) increases by one unit, then Learning Achievement (Y) will increase by 0.037 units. Furthermore, by measuring the contribution between variables, namely determination analysis, the results can be seen in Table 3.

Table 3. Coefficient of Determination (R^2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939 ^a	.881	.877	2.23976

The results of multiple regression analysis showed a multiple correlation coefficient (R) value of 0.939. Correlations close to 1 or -1, e.g., in the 0,90s or -0,90s, are usually considered indicative of a strong linear relationship. This shows that the independent and bound variables have a strong relationship with the categories (Raykov & Marcoulides, 2014). The coefficient of determination (R^2) was 0.881 (88.1%). This indicates that the independent variable has an 88.1% influence on the dependent variable, with the influence of Intellectual Intelligence 28.2%, Emotional Intelligence 54.4%, and Spiritual Intelligence 5.5%, while other factors that are not part of this research variable influence the remaining 11.9%.

Next, we tested the hypothesis simultaneously for all independent variables against the dependent variable using the F-test approach, as shown in Table 4. The simultaneous test is shown by the calculation results of F_{count} , which show a value of 314.317 greater than the F_{table} of 2.70. For simultaneous tests using the significance value (Sig.) of the Nova output, the Sig. value of 0.000 is obtained, which means below 0.05 (alpha 5%). This means that the variables of intellectual intelligence, emotional intelligence, and spiritual intelligence simultaneously have a significant effect on learning achievement in the physical education subject of Senior High School.

Table 4. Simultaneous Test Results (Test F)

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3426.440	3	1142.147	227.678
	Residual	461.519	92	5.017	.000 ^b
	Total	3887.958	95		

Thus, it can be concluded that H_0 rejected and H_1 accepted. A t-test approach was used to determine the impact of each variable. The calculation results are listed in Table 5. For the intellectual intelligence variable, it can be concluded that the t-test is partial, as shown by the calculation results of $t_{\text{calculate}}$, which show a value of 5.800, greater than the t_{table} of 1.66105. Using the significance value (Sig.), we obtained a Sig. value of 0.000, which means below 0.05 (alpha 5%). This means that the Intellectual Intelligence variable partially has a significant effect on learning achievement pencak silat material in the Physical Education subject of Senior High School, so the test results state that H_0 is rejected and H_1 is accepted.

For the emotional intelligence variable, it can be concluded that the t-test (partial) is shown by the calculation results of $t_{\text{calculate}}$, which show a value of 7.434, greater than t_{table} of 1.66105. Significance value (Sig.), we obtained a Sig. value of 0.000, which means below 0.05 (alpha 5%). This means that the emotional intelligence variable partially has a significant effect on learning achievement in the physical education subject in Senior High School, so the test results state that H_0 is rejected and H_1 is accepted.

Table 5. Partial Test Results (Test t)

	Model	t
1	(Constant)	-4.059
	Intellectual Intelligence	5.431
	Emotional Intelligence	10.407
	Spiritual Intelligence	2.499

For the spiritual intelligence variable, it can be concluded that the t-test is partial, as shown by the calculation results of $t_{\text{calculate}}$, which show a value of 2.499, greater than t_{table} of 1.66105. Significance value (Sig.), we obtained a Sig. value of 0.000, which means below 0.05 (alpha 5%). This means that the spiritual intelligence variable has a significant effect on the learning achievement of pencak silat in the physical education of students at Senior High School. This means that H_0 is not supported and H_1 is supported.

Emotional intelligence has a t_{count} of 10.407, higher than intellectual (5.431) and spiritual intelligence (2.499). This suggests that emotional intelligence has a greater impact on pencak silat learning in physical education courses at Senior High School than the other two intelligence variables. Pencak silat, because it is a martial arts sport, may be more emotional (Di Corrado et al., 2020).

The results yielded an F_{count} value of 227.678, which exceeded the F_{table} value of 2.70 at a significance level of $0.000 < 0.05$. Therefore, it can be inferred that the null hypothesis (H_0) is rejected. The acceptance of H_1 indicates that the variables Intellectual, Emotional, and Spiritual Intelligence together have a substantial impact on the learning achievement of pencak silat in physical education topics at Senior High School.

The success of education is contingent upon the academic accomplishments of individual students in the school setting. Based on this research, it was established that the components that are anticipated to enhance learning performance encompass intellectual, emotional, and spiritual intelligence. If children possess high intellectual capacity, one distinguishing feature is that their cognitive talent is above the average of their peers. Additionally, they possess commendable emotional intelligence, exemplified by their positive interactions with their social surroundings. This includes demonstrating a responsible approach towards tasks, such as displaying seriousness. Ensuring the timely completion of homework assignments and cultivating spiritual intelligence to gain the pleasure of Allah SWT would greatly influence the academic achievements of students at Senior High School, Bekasi Regency. If intellectual, emotional, and spiritual intelligence factors can be enhanced simultaneously, then student learning accomplishment will reach its maximum potential.

Each increment in the independent variable resulted in a corresponding increase in the dependent variable. Therefore, we may infer from the initial hypothesis that intellectual intelligence (X_1), emotional intelligence (X_2), and spiritual intelligence (X_3) collectively have a substantial impact on the attainment of pencak silat learning (Y). These findings align with the research undertaken by Yahya et al. (2020), indicating that intellectual, emotional, and spiritual intelligence exert a substantial impact on academic performance. As is known from research results, 88.1% of learning achievement is influenced by intellectual, emotional, and spiritual intelligence, while 11.9% is influenced by other aspects that were not researched.

One influencing aspect could be the limitations of research statistics. This research relies on multiple linear regression analysis, which assumes a linear relationship between variables. This may not capture the complexity of interactions between different types of intelligence and learning outcomes. In addition, there may be potential bias in reported intelligence measures, as such measures may not accurately reflect students' true abilities or their impact on learning achievement.

Multiple other studies have asserted that intellectual intelligence exerts a substantial impact on academic attainment, specifically by positing that the calibre of intellectual intelligence affects cognitive capacity, which, in turn, affects educational outcomes (Valentina et al., 2019). Individuals with high cognitive intelligence typically exhibit ease in acquiring knowledge and demonstrate favourable outcomes. Conversely, those with inferior cognitive abilities often face challenges in acquiring knowledge and exhibit slower cognitive processing, resulting in poorer academic performance. Farhan and Rofi'ulmuiz (2021) conducted a study that demonstrates the favourable influence of intellectual intelligence on learning motivation, ultimately leading to improved learning outcomes. The ramifications of these findings offer a more profound understanding of the influence of intellectual intelligence on the formation of learning motivation and eventually, academic accomplishment, although the results of research conducted by Nugroho show things that are different from the results of this research (Nugroho et al., 2023).

Conversely, the emotional intelligence variable asserts that emotional intelligence has a substantial and favourable impact on the academic success of pupils in pencak silat. Empirical evidence supports the notion that higher emotional intelligence is positively correlated with students' cumulative success indices (Ackley, 2016). Bakar (2014) found individuals with strong psychological self-control can effectively enhance their motivation and self-confidence when learning; as demonstrated by Lin et al. (2017) motivation has the potential to impact student learning outcomes. Moreover, it is an integral aspect of emotional intelligence that directly influences academic accomplishments (Mega et al., 2014).

Furthermore, numerous studies affirm that spiritual intelligence has a substantial impact on learning outcomes (Hasmi, 2019). Individuals with high spiritual intelligence are likely to attain significant accomplishments because they possess the ability to self-motivate in the face of challenges by finding solace within themselves and extracting valuable lessons from their experiences (Noerpratama, 2019). Ghalaychi et al. investigated the correlation between spiritual health, spiritual intelligence, and client satisfaction, shedding light on the wider influence of spiritual intelligence (Ghalaychi et al., 2019). These findings emphasise the significance of spiritual intelligence in educational settings and its potential impact on student achievement.

The effective contribution of each variable is that the intellectual intelligence variable effectively contributes to cognitive abilities like memory, problem solving, and analytical thinking. High intellectual intelligence is often associated with better academic achievement because it is easier to understand and apply new concepts. Emotional intelligence involves self-awareness, emotional regulation, motivation, empathy, and social skills. High emotional intelligence can help students manage stress, cooperate with others, and maintain motivation to learn. Spiritual intelligence relates to a deep understanding of oneself, values, and greater life goals. Spiritual intelligence can provide perspective and motivation that help students see the importance of education and learning.

Among the three intelligence variables mentioned, it was found that the emotional intelligence variable has the most significant impact on the learning achievement of students in the physical education topic of senior high school. This finding aligns with previous research that underscores the significant impact of emotional intelligence on improving academic performance in educational settings (Acoci et al., 2022). Faradillah et al. (2022) demonstrated a direct and substantial correlation between emotional intelligence and academic performance. Collectively, these studies demonstrate that emotional intelligence significantly influences academic achievement. To enhance students' emotional intelligence, it is important to provide distinct training sessions (Chandra, 2021), including positive self-talk activities (Rizal et al., 2021). This aligns with the practices of elite athletes who compete at the pinnacle of their sports.

By having high emotional intelligence, students may be better at managing stress; they can remain calm and focused under pressure, which is important when facing exams or other assignments. Emotional intelligence can also make students better able to work in teams; the ability to collaborate with others can

improve the learning experience and open up collaborative learning opportunities. Additionally, they may have a strong internal drive to achieve their goals, which can help them overcome barriers to learning. In an educational context, a holistic approach that considers all aspects of intelligence can provide a more supportive and effective learning environment for students to achieve their maximum potential.

However, of course, the author realises that this research has limitations. This research relies on multiple linear regression analysis, which assumes a linear relationship between variables. This may not capture the complexity of interactions between different types of intelligence and learning outcomes. Additionally, there may be potential bias in the reported intelligence measures, as they may not accurately reflect a student's actual abilities or their impact on academic achievement. As a result, the author attempts to express several alternative interpretations as a basis for subsequent research, including: Cultural influence: specific cultural factors in the research region may influence the relationship between intelligence type and learning achievement. Different cultural contexts may produce different results. Developmental stages: the impact of these intelligences on learning achievement can vary depending on the student's developmental stage. What works for high school students may not work for younger or older students. Subject-specific effects: this study focusses on physical education, which may involve different aspects of intelligence compared to other subjects. Conducting the research in a different academic context may lead to different findings. Interrelated intelligence: these intelligences may not act independently but rather interact with each other to influence learning achievement. This research approach may not fully capture the synergistic effects of these interactions; measurement variability and the tools used to measure intelligence can influence the results. Different instruments or measurement methods may provide alternative insights into the relationship between types of intelligence and learning achievement. These alternative interpretations highlight the complexity of educational research and the need for a differentiated understanding of how various factors contribute to learning outcomes. They also suggest areas that need further investigation to deepen our understanding of this relationship.

CONCLUSIONS

This study offers new contributions to the field of physical education, especially emotional intelligence, as it turns out to be more dominant in learning outcomes. This study shows the necessity of developing emotional intelligence within the context of physical education, particularly in relation to pencak silat. Methodologically, this study applies a rigorous and comprehensive quantitative approach with very cogent statistical analysis that could serve as a reference for further research. These findings can be used by teachers and schools in practice in designing more effective programs to enhance all aspects of student intelligence, especially emotional intelligence, in order to improve student learning outcomes in pencak silat. The researcher proposes all students strive for improvement in all aspects of their intelligence through internal and external programs by the teachers or schools in activities related to intellectual, emotional, and spiritual intelligences. The researchers should, therefore, extend this by developing the study with different variables and indicators so that information concerning the factors affecting learning performance gets better documentation. Further research can also be done to investigate the interaction of this intelligence with other variables like motivation, learning environment, and teaching methods, among others, for comprehensive understanding.

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CONFLICT OF INTEREST

All authors declare no conflict of interest.

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