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Abstract

Higher education has typically been explained in terms of cognitive ability (IQ), when predicting academic achievement. However, despite the evidence of non-cognitive intelligence, specifically emotional intelligence and spiritual intelligence, their association with academic achievement is still less explored. In Ghana where there is a strong inclination towards spiritual orientation, there scares research on how emotional intelligence and spiritual intelligence combine influence academic achievement among higher education students. Partial least Square Structural Equation modelling (PLS-SEM) and Fuzzy-set Qualitative Comparative Analysis (FsQCA) to assess symmetrical and asymmetrical pathways. PLS-SEM shows that emotional intelligence significantly predicts academic ($\beta = .0344, p < .001$) and spiritual intelligence ($\beta = 0.661 p < .001$). spiritual intelligence is associated with academic achievement ($\beta = .371, p < .001$). The model explains 43.4% of the variance in academic achievement. The FsQCA finds equifinality, indicating that spiritual intelligence and emotional intelligence together provide a sufficient condition for academic achievement with 87.8% coverage and 0.803 consistency. Also, either spiritual intelligence or emotional intelligence can compensate for the absence of the other in predicting academic achievement. The findings demonstrate that emotional intelligence and spiritual intelligence independently and interactively influence academic achievement and support a multidimensional perspective of intelligence. The study advocates for institutional reforms in higher education in Ghana and similar settings, recommending integration of these competencies into educational curriculum, assessment, and student development policies.

Keywords: Emotional intelligence, Spiritual intelligence, Academic achievement, PLS-SEM, FsQCA, Higher Education.

Introduction

Traditionally, academic achievement has been linked to cognitive abilities, such as intelligence quotient (IQ), in the educational system. Despite this, cognitive skills alone cannot account for academic achievement among higher education students, as other dimensions of intelligence also play a vital role (Parker et al., 2004). Beyond cognitive abilities, emotional and spiritual intelligence have been shown to contribute to students' academic achievement (Nasir, 2010).

Many studies reveal that emotional intelligence enhances students' mastery of skills, complex physical activities, and mental skills, thereby improving overall academic achievement in higher education settings (Faradillah et al., 2022; Masruroh et al., 2024; Rizal et al., 2024). Again, emotional intelligence improves academic resilience and predicts academic achievement among higher education students by helping them devise strategies in their learning environment (Adu-Gyamfi et al., 2024; Cejudo et al., 2020; Ononye et al., 2022). Similarly, intellectual, emotional, and spiritual intelligence influence academic performance among students, with emotional intelligence as a standout influence on academic achievement, particularly in awareness and mastery of skills (Rizal et al., 2024). However, mixed findings remain where emotional intelligence is positively related to academic engagement but not to performance (Silva & Almeida, 2023).

Likewise, spiritual intelligence fosters specific learning patterns and all-inclusive development, which promote self-awareness and personal growth (Emmons, 2000). Spiritual intelligence positively predicts academic success among students at Delhi University (Raheja et al., 2024). Also, Taupik (2025) reveals that SI, EI, and intellectual intelligence can improve student academic

achievement by up to 60.3% of the variance in English. This makes fragmented literature addressing either spiritual intelligence is associated with academic achievement.

Existing studies are western dominated leaving limited evidence from Africa and Ghana, which raises concerns about generalizability in other cultures. According to the Ghana Statistical Service (2021), 94.4% of students exhibit a strong inclination towards spiritual beliefs. However, students in higher education institutions in Ghana often neglect other forms of intelligence, particularly spiritual and emotional intelligence. The centrality of spiritual intelligence of its meaning-making, value orientations and identity formation is unexplored in Ghana's higher education institutions as assessment relies solely on cognitive abilities.

Furthermore, few studies have combined asymmetrical and symmetrical in context of Ghana, in terms emotional intelligence and spiritual intelligence in predicting academic achievement.

Amid technological advancements in education, student development should not focus solely on cognitive domains but also include spiritual and emotional intelligence, which has been overlooked (Abidin et al., 2024). However, most Ghanaian higher education institutions assess students cognitively, leaving other forms of intelligence, such as emotional and spiritual intelligence. This study examines the impact of spiritual and emotional intelligence on student achievement at Kwame Nkrumah University of Science and Technology in Ghana, aiming to inform holistic education and improve student learning. Again, it examines symmetrical and asymmetrical approaches in predicting academic achievement among higher education students.

Literature review

EMOTIONAL INTELLIGENCE

All human beings have emotional needs, and each person differs in the strength of these needs. Emotions are independent of our conscious mind and can be complex in connecting with student learning. Emotions connect our body and soul, making choices and conveying meaning or understanding. It also helps students in higher education to interact socially and communicate with others, guiding our general assessment and experience of the world. Goleman (1995) belief that emotions significantly influence cognitive function, judgement, and social skills. These are essential for students' personal and professional development to understand their emotions in academic settings.

Emotional Intelligence (EI) is the theory that holds that understand and managing emotions is a distinct form of intelligence. This ability is essential for personal and social performance. Emotional intelligence was first formally defined as an ability-based intelligence, like cognitive intelligence (Salovey & John Mayer 1990). It is the capacity to perceive emotions, to use emotions to facilitate thinking, understand emotional meanings, and to regulate emotions in oneself and others (Shengyao et al., 2024). It focuses on relationships and effective self-management. Therefore, this study sought to examine the role of emotional intelligence in the educational setting.

Emotional intelligence implies that they identify, understand and manage their own and others' emotions. The concept of emotional intelligence was rooted in Thorndike social intelligence. It

gains popularity when Salovey & Mayer 1990 book and Goleman's 1995. However, Goleman demonstrated that emotional intelligence is far from IQ critical for performance specifically, in leadership. A high emotional intelligence score which reflects a strong personality and effective self-management, both of which are vital for future professional performance.

Emotional intelligence involves understanding and managing one's emotions including self-regulation and fostering desirable behaviour to improve life quality and relationship management (Salovey & Grewal, 2005). Mayer et al. (2000) stress on the influence emotional intelligence (EI) in managing emotions.

Emotional intelligence is a form of social intelligence that includes tracking emotions, distinguishing among them, and applying this knowledge to inform decisions and behaviour (Salovey & Grewal, 2005). Emotional intelligence entails empathy, assessment, drive and willingness to respond to emotions of happiness and sorrow in one or others (Goleman 1995). Therefore, to improve students' learning results, recent reforms in the educational system have shifted the attention to elements other than cognitive ability, such as Educational Interventions (MacCann et al., 2019) The majority of American academic institutions provide extensive training programs to improve emotional intelligence (EI) capabilities, which are essential in educational environments across the globe (Herrera et al., 2020). psychologically affects students' academic achievement, highlighting their growing importance in teaching and learning (Ubago-Jimenez et al., 2024). To improve students' academic performance and personal development, schools and institutions invest significantly in developing their emotional intelligence (EI) (MacCann et al., 2019). Since emotional intelligence has been linked to higher academic achievement, improving emotional intelligence may lead to greater academic performance (Nieto-Carracedo et al., 2024)

EMOTIONAL INTELLIGENCE ON ACADEMIC INTELLIGENCE

To improve students' learning results, recent reforms in the educational system have shifted the attention to elements other than cognitive ability, such as Educational Interventions (MacCann et al., 2019). Most American educational institutions offer extensive training programs to improve emotional intelligence (EI), which is essential in educational environments worldwide (Herrera et al., 2020). Because psychological factors have been shown to affect students' academic achievement, especially at the university level, they have become increasingly important in teaching and learning (Ubago-Jimenez et al., 2024). To improve students' academic performance and personal development, schools and institutions invest significantly in developing their emotional intelligence (EI) (MacCann et al., 2019). Since emotional intelligence has been linked to higher academic achievement, improving emotional intelligence may lead to greater academic performance (Nieto-Carracedo et al., 2024).

A study by Ahmad et al. (2019) investigated university students' emotional intelligence and its relationship to academic performance. A sample of 400 final year semester undergraduate students at the university of Sargodha, comprising of 160 males and 240 females, was randomly selected across 14 department and seven faculties. The study found moderately strong positive association between academic achievement and emotional intelligence, indicating that universities should implement activities to improve emotional stability. Another study examines the relationship between emotional intelligence and academic achievement among 200 children from different socioeconomic backgrounds in Ranchi. It shows a positive correlation but also reveals differences

in emotional intelligence and academic achievement among students from various socioeconomic backgrounds (Ghosh, 2014). Again, a study examined the correlation between emotional intelligence (EI) and academic achievement among first-year undergraduate students at Wollo University, where found a positive relationship among EI, educational engagement, and academic achievement, indicating a direct effect of EI (Bereded et al., 2025).

Similarly, emotional intelligence scores of 150 four-year integrated B.Ed. students Trainees at Gangadhar Meher University showed that 6% had high emotional intelligence scores, while 94% had above-average scores. There was no significant difference was found between genders. Highly emotionally intelligent students had higher academic achievement scores than those with low scores. Implies that students in training schools portray emotional intelligence in their academic activities. Mohebi et al. (2018) study also found a significant positive correlation between emotional intelligence and academic performance.

H1: Emotional intelligence predicts spiritual intelligence

H2: Emotional intelligence predicts academic achievement among higher education students

SPIRITUAL INTELLIGENCE

Spiritual intelligence, a new psychological concept, is gaining attention for its potential impact on various aspects of human life, including academic performance (Ratnawat, 2023). Spiritual Intelligence, regarded as a form of human intelligence, integrates all forms of intelligence. It is essential for evaluating one's deeds and life path, involving understanding, regulation, and application spiritual and religious views and practices.

The inner life of the mind and spirit, and its connection to existence in the world, is linked to spiritual intelligence (Vaughan 2002). While human beings have tempered strict norms of understanding and compassion, spiritual intelligence may be created relatively independently and has the capacity to discriminate with a moral sense. It also recognizes when compassion and understanding reach their limits.

It is a framework for identifying and classifying the abilities required for the flexible application of spirituality. Humans are thought to have an innate yearning to feel a connection to something greater than themselves, something divine or exceptionally noble; this link transcends all traditions and religions (Wigglesworth 2012). The transformation of the individual from fragmentation to integration, or intrapersonal integration, is the aim of spiritual intelligence (Emmons 2000a).

The World Health Organisation is also eager to look beyond the social, mental, and physical aspects of health, and its member nations are actively investigating the fourth aspect of health, spiritual well-being and how it affects a person's overall health and happiness. At the 52nd World Health Assembly, the spiritual dimension was explored as an addition to the physical, mental, and social dimensions of health. According to WHO (1999), the proposal aimed to redefine health as a dynamic condition of total physical, mental, spiritual, and social well-being rather than just the absence of illness or disability.

Spiritual intelligence (SQ) is a human capacity that transcends cognitive and emotional metrics, encompassing qualities such as meaning-making, transcendence, consciousness, and the integration

of spiritual ideals into everyday life. In this study spiritual intelligence comprises cognitive abilities in psychology and spirituality that allow humans to connect with transcendent and existential dimensions of existence, fostering awareness, integration, and adaptive utilisation.

Zohar and Marshall's concept of spiritual intelligence (SQ) highlight its function in unifying other forms of intelligence, promoting coherence across diverse dimensions of human experience and consciousness (Negi & Khanna, 2017). Spiritual intelligence (SQ) is an essential academic concept in psychology that enhances problem-solving and critical existential reasoning, potentially augmenting student achievement (Joshi, 2019). Spiritual intelligence, popularised by Danah Zohar and Ian Marshall in the 2000s, is the ability to find meaning, integrate values, and overcome challenges. It is now integrated into mental health, promoting resilience, emotional balance, and holistic well-being through practices like mindfulness and value-based living (Sneha & Gowri, 2016)

SPIRITUAL INTELLIGENCE AND ACADEMIC ACHIEVEMENT

Spiritual intelligence relates to academic achievement through diverse interrelated factors, with cognitive merits acting as a major pathway academic achievement. Spiritual intelligence promotes cognitive flexibility, critical thinking, creativity, and problem-solving skills, which are essential for academic achievement. Hasanvand's (2020) study shows a relationship between spiritual intelligence and cognitive flexibility among high school students, in Iran, demonstrating that these factors predict academic achievement.

Siddiqui and Khan (2018) discovered that a survey of 360 Pakistani university students, showed positive tie between heightened spiritual intelligence and improve psychological well-being. It implies that psychological well-being is crucial relationship between spiritual intelligence and academic achievement. Abdollahi et al. (2019) found that spiritual intelligence provides students with a sense of purpose and meaning, hence contributing to fulfilment and satisfaction and improved psychological resilience.

Spiritual intelligence enhances cognitive and emotional intelligence by allowing individuals to use spiritual and non-material resources for problem-solving and well-being, indicating a correlation with academic achievement (Ratnawat, 2023). Spiritual practices such as mindfulness and prayer enhance spiritual intelligence and effective coping strategies for academic stresses and issues (Anwar & Rana, 2024).

Ratnawat, (2023) reported that academic performance influences spiritual intelligence by promoting psychological well-being, therefore improving cognitive abilities, critical thinking, and problem-solving skills. Andriyani, (2023) showed a relationship between spiritual intelligence and academic achievement, suggesting that high spiritual intelligence improves students' motivations yet low spiritual intelligence recesses it. Again, students in higher education spiritual intelligence increases and improves academic achievement however lower spiritual intelligence led to decrease academic success.

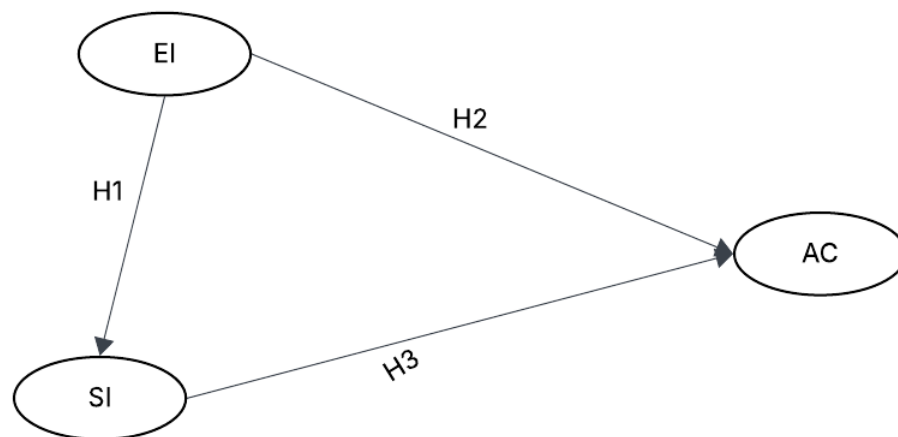
Moreover, spirituality showed impacts students' academic engagement through accomplishment motivation and resilience, and resilience, thereby improving academic success among students with spiritual inclinations (Mawardi & Şen, 2023). Integrating spiritual intelligence into educational

environments can promote students' motivation, strengthen institutional credibility, and mitigate ethical challenges, so fostering school culture (Ramachandaran et al., 2017).

Spiritual intelligence being a strong predictor of psychological well-being, with male students reporting higher levels of intelligence than female students, potentially improving psychological well-being by offering purpose and effective coping mechanisms (Anwar & Rana, 2024). Again, a study shows a positive correlation between spiritual intelligence and religious attitudes, emphasizing spiritual intelligence and anxiety among students (Ahang, 2014). Importantly, religious attitudes did not influence intellectual intelligence and anxiety.

H3: spiritual intelligence influences academic achievement

Conceptual framework



Methods

This study employed mixed method approach where both quantitative to understand emotional intelligence and spiritual intelligence in predicting academic achievement (Creswell & Creswell, 2018). Again it is the integration of qualitative and quantitative research thereby triangulating their findings for better understanding of the concept (Clark et al., 2021). Also, it blends quantitative and qualitative data to extract finding from combined dataset (Creswell & Creswell, 2018, 2023). Mixed method entails acquiring and analysing quantitative and qualitative data, integrating these datasets via established procedures, and assessing the results from both (Creswell & Inoue, 2025; Creswell & Plano Clark, 2018). This offers diverse perspective from the dataset to arrive at the conclusion. Specifically, a sequential explanatory design was utilized in which quantitative insights were derived from the dataset before qualitative data was used to explain them (Creswell & Creswell, 2023). This allows the researcher to understand symmetrical relationships and configurational

conditions in predicting academic achievement. A stratified sampling technique of 339 students from the six colleges Kwame Nkrumah University of Science and Technology.

Instrumentations

The study adapted the Brief Emotional Intelligence Scale (BEIS) by Davies et al. (2010), with five dimensions: appraisal of one's emotions, appraisal of others' emotions, regulation of one's emotions, regulation of others' feelings, and utilisation of emotion. Again, the study used the Spiritual Intelligence Self-Report Inventory (SISRI-24) by King (2008), and Mehrvarz et al. (2021) academic achievement scale was adapted. The researchers employed an online priori sample size calculator for structural equation modelling (Soper, 2026) to determine for the minimal number of required responses for adequate statistical analysis with the effect size was 0.3 and statistical power was 0.95. The analysis to detect minimum effect was 227 including safety factor of 10%.

Ethical considerations

The study adheres to ethics which is the most prominent academic setting. The researchers made sure the research followed ethical principles such as anonymity, confidentiality, maleficence and beneficence. Ethical clearance was obtained from the research ethics committee of Kwame Nkrumah University, Science and Technology Kumasi, Humanities and Social Sciences Research Ethics Committee with reference number. HuSSREC/AP/260/VOL.4.

Results

Demographic characteristics

399 undergraduate students participated in the study from the six colleges in Kwame Nkrumah university of science and technology. The gender distribution includes of 128 (37.8%) males and 211 (62.2%) females. The age distribution was 21-30 (206, 60%), it was followed by below 20 years (105, 31.0%). While 31-40 years (22, 6.5%) and the last was 41 years and above (6,1.8%). The study further looked at religious affiliations of the participants. It was revealing that majority of the participant were Christians (300,88.5%), next by Muslim (35,10.5) and last was others (4,1.2%). Again, since the sample was drawn from six colleges at KNUST. The college Art and Built environment accumulated (199, 58.7%), followed by College of Agriculture and Natural Resources (44, 13.0%), also college of science contributes (29, 8.6%). College of Engineering accounted for (24, 7.1%) and the last was college of Health Sciences (19, 6.5%).

Table 1: Demographic characteristics

Respondent profiles	Number (N)	Frequency	Percentage (%)
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Gender	339	Male	128	37.8%
		Female	211	62.2%
Age		Below 20	105	31.0%
		21-30	206	60%
		31-40	22	6.5%
		41 and above	6	1.8%
Religion		Muslim	35	10.3%
		Christian	300	88.5%
		Others	4	1.2%
Colleges		College of Science	29	8.6%
		Colleges of health sciences	19	5.6%
		College of Agriculture and Natural Resources	44	13.0%
		College of Art and Built Environment	199	58.7%
		College of Engineering	24	7.1%

Measurement model

The measurement model was analysed to determine construct reliability, validity, factor loadings, variance inflation factors (VIFs), and average variance extracted (AVE). The model showed internal consistency loadings above the benchmark of 0.70 (Hair et al., 2021,2022). The loads for emotional intelligence ranged from 0.714 to 0.757; those for spiritual intelligence ranged from 0.713 to 0.791. Again, academic achievement had the highest loading of 0.818 to 0.882. These results support the construct's convergent validity, as each indicator meaningfully contributes to the measurement of its latent variable. Moreover, construct reliability and validity assessment demonstrated that all constructs met recommended thresholds. Cronbach's alpha values ranged from 0.788 to .872, exceeding the minimum acceptable level of .70 (Nunnally & Bernstein, 1994). Specifically, academic achievement had 0.872, emotional intelligence was 0.788, and spiritual intelligence had 0.804, thus proving internal consistency. Furthermore, Composite reliability values ranged from .761 to .912, further confirming reliability. The average variance extracted (AVE) values were 0.723 for Academic achievement, 0.575 for Emotional Intelligence, and 0.561 for Spiritual Intelligence, all above the .50 threshold (Fornell & Larcker, 1981), providing evidence of convergent validity. These results confirm that the constructs were measured reliably and validly.

Additionally, the variance inflation factor (VIF) was used to assess multicollinearity among the constructs. The study showed values ranging from 1.440 to 2.603, which are below the threshold of 5 (Hair et al., 2022), indicating no collinearity issues. This suggests that the construction is reliable and valid for further analysis. Moreover, the measurement model results showed that all indicators loaded strongly on their respective constructs, exceeding the recommended threshold of .70 (Hair et al., 2022). Figure 1 presents the outer loadings for Academic achievement (AC), which ranged from 0.818 to 0.882, indicating excellent indicator reliability. Emotional intelligence (EI) indicators showed loadings ranging from 0.719 to 0.760, all within acceptable levels. Similarly, spiritual intelligence (SI) indicators loaded between 0.713 and .791, reflecting good construct reliability. These results support the construct's convergent validity, as each indicator meaningfully contributes to the measurement of its latent variable.

Table 3: Assessment of model measurement

construct	Items	loadings	VIF	Cronbach's alpha	Composity reliability rho_a	Composity reliability rho_c	AVE
Emotional intelligence	EI_AO TE_1	0.757	1.717	0.788	0.793	0.854	0.540
	EI_AO TE_2	0.714	2.603				
	EI_RO E_1	0.719	1.440				
	EI_RO E_2	0.723	1.429				
	EI_UO E_1	0.760	1.471				
Spiritual intelligence	SI_4	0.713	1.447	0.804	0.805	0.865	0.561
	SI_5	0.715	1.436				
	SI_9	0.739	1.498				

	SI_12	0.791	1.881				
	SI_13	0.784	1.910				
Academic achievement	AC_1	0.833	1.962	0.872	0.874	0.912	0.723
	AC_2	0.866	2.322				
	AC_3	0.882	2.508				
	AC_4	0.818	1.920				

Discriminant validity

The study assessed the discriminant validity employing Fornell-Larcker criteria and the heterotrait-monotrait ratio (HTMT) to check the distinct construct empirically. Table 3 shows the analysis of the Fornell-Larcker criteria, where AVE was higher than its intercorrelations with other constructs. Academic achievement had a value of 0.850, and both emotional and spiritual intelligence had values of 0.589. Emotional intelligence showed discriminant validity, with a diagonal value of 0.735, surpassing its association with spiritual intelligence (0.661). Similarly, spiritual intelligence showed a diagonal value of 0.749, surpassing its relationships with both academic accomplishment and emotional intelligence. Per the HTMT criterion, in Table 3, all HTMT values must not exceed 0.90. The results from the current model indicate that the constructs are distinct, as none exceed this threshold (Hair et al., 2021, 2011). The values for academic achievement and emotional intelligence were 0.700; for spiritual intelligence and academic achievement, 0.712; and for spiritual intelligence and emotional intelligence, 0.824, thus indicating distinct constructs empirically.

Table 4: Discriminant validity

Fornell-Larcker criteria			
construct	Academic achievement	Emotional intelligence	Spiritual intelligence
Academic achievement	0.850		

Emotional intelligence	0.589	0.735	
Spiritual intelligence	0.598	0.661	0.749
hetrotrait -monotrait ratio (HTMT)			
AC			
EI	0.700		
SI	0.712	0.824	

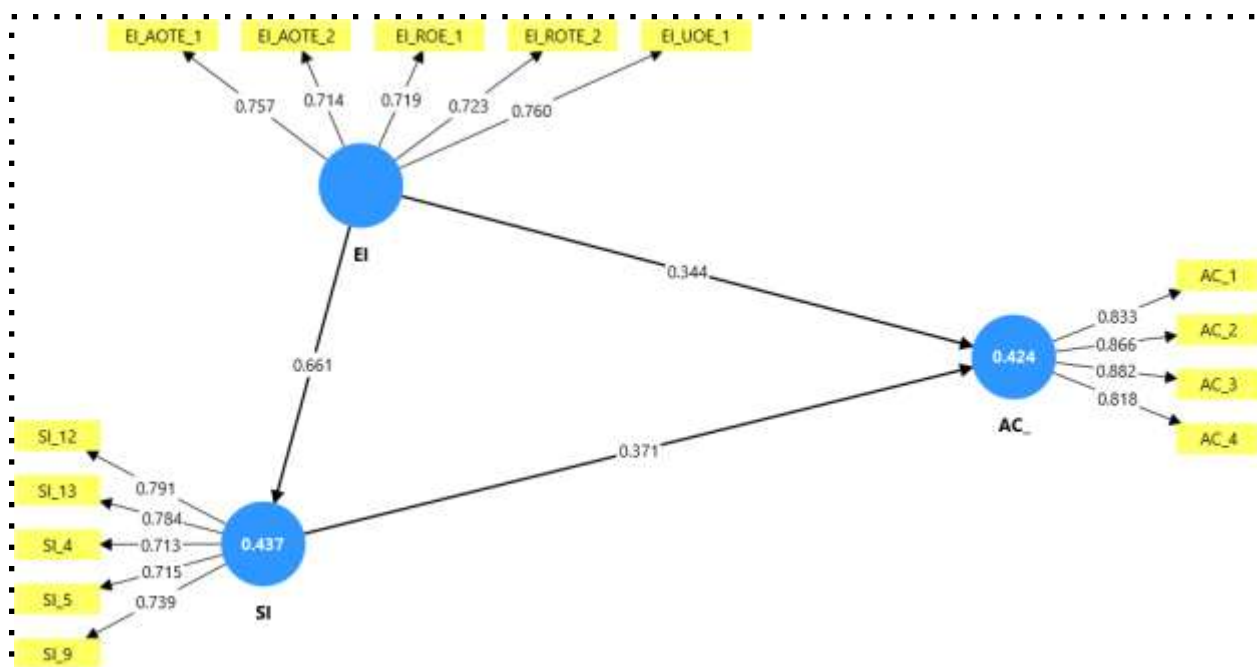


Figure 1

An analysis with 5,000 resamples was assessed to decide the study's hypothesis. The findings of the results presented in Table 4 shows that all hypotheses were supported. H1 show that emotional

intelligence had a positive and significant effect on academic achievement ($\beta = 0.344$, $t = 5.552$, $p < .001$). Also, H2 showed that emotional intelligence had a strong positive impact on spiritual intelligence ($\beta = 0.661$, $t = 19.769$, $p < .001$). Additionally, H3, thus spiritual intelligence significantly predicts academic achievement, ($\beta = 0.371$, $t = 6.377$, $p < .001$). The results indicate that emotional intelligence does not only promote spiritual intelligence raises increases, academic achievement indirectly. meanwhile, spiritual intelligence plays integral part of academic achievement.

Table 5 Hypothesis Testing

Construct	t	β	P vale	hypothesis	Bias corrected	Bootstrapping	
						2.5%	97.5%
EI →AC	5.552	0.344	0.000	supported	-0.000	0.223	0.462
EI →SI	19.769	0.661	0.000	supported	0.003	0.586	0.719
SI →AC	6.377	0.371	0.000	supported	0.002	0.254	0.483

Structural model assessment

The study utilised variety of criteria to examines the structural model's explanatory power and predictive relevance of F^2 , R^2 , adjusted R^2 , Q^2 , RMSE and model fit indices. The study exhibited accumulated variance 43.5 % of Academic achievement. The combined effect of both emotional intelligence and spiritual intelligence, with an adjusted R^2 , was 0.421. At the same time, spiritual intelligence showed strong explanatory power, accounting for 43.7% of the variance and yielding an adjusted R^2 of 435. The effect size for emotional intelligence on academic achievement ($f^2 = 0.116$) was moderate, but EI had a large effect on spiritual intelligence ($f^2 = 0.775$). Meanwhile, spiritual intelligence had a moderate impact on academic achievement ($f^2 = 0.135$). Predictive relevance was assessed to evaluate predictive accuracy. Academic achievement had a Q^2 of 0.336 and an RMSE of 0.762, while spiritual intelligence showed a Q^2 of 0.427 with an RMSE of 0.822, confirming that the model has acceptable out-of-sample predictive capability. The model fit summary of the present investigation indicates a good fit, with an SRMR of 0.062 and an NFI of 0.94, both within the recommended thresholds of $SRMR < 0.08$ and $NFI > 0.90$, indicating a robust model fit in PLS SEM analysis. Table

Table 6: structural model and predictive assessment

construct	R ²	Adjusted R ²	f ²	Saturated model	Estimated model	Q ²	RMSE
AC	0.434	0.421				0.336	0.762
SI	0.437	0.435				0.427	0.822
EI AC			0.116				
EI SI			0.775				
SI AC			0.135				
SRMR				0.071	0.071		
d_ ULS				0.531	0.531		
d_ G				0.173	0.173		
chi-square				341.206	341.206		
NFI				0.839	0.839		

FsQCA results

The study utilised an asymmetrical approach to investigate non-linear relationships of academic achievement through emotional intelligence and spiritual intelligence using FsQCA. The analysis is calibrated where questionnaire data are transformed into fuzzy sets range from 0 to 1. In the scale 0 suggests no membership, 0.5 stands for crossover point, and 1 represent full membership. The study used 5-point likert scale with direct calibration. According to the benchmark for calibration of 95%, 50%, and 5% percentile following the guidelines by (Rihoux, 2006).

Parsimonious solution

The parsimonious solution distills the complex solution conditions. Table 1 shows that both emotional intelligence and spiritual intelligence exceed the 0.80 sufficiency, threshold with consistencies of 0.851 and 0.844 respectively. Raw coverage of 0.782 and 0.806, indicating that each explains a substantial proportion of outcome (Fiss, 2011). Their unique coverage 0.071 and 0.095 suggest overlap rather than independent action. The configuration achieves a solution coverage of 0.878 (87.8%) and consistency of 0.803, indicating robustness (Schneider &

Wagemann, 2012). Thus, emotional and spiritual intelligence jointly serve as core sufficient conditions, providing a strong explanatory of academic achievement.

Table 7: parsimonious solution

Constructs	Raw coverage	Unique coverage	consistency
EI	0.782397	0.0711581	0.850834
SI	0.806437	0.0951979	0.84376
Solution Coverage	0.877595		
Solution	0.803262		
Consistency			

Note: EI = emotional intelligence, SI = Spiritual intelligence

Intermediate solution

The intermediate solution provides a setup for academic achievement. The result shows that emotional intelligence and spiritual intelligence are combined effectively. Emotional intelligence had a consistency of 0.851, and spiritual intelligence also had a consistency of 0.844. Emotional intelligence raw coverage was 0.782, and spiritual intelligence was 0.844. Emotional intelligence alone explains 0.071 (7.1%) of academic achievement beyond overlap with other conditions, and spiritual intelligence unique coverage of 0.095 (9.5%) of academic achievement are attributed to it in the configuration. Further, the configuration achieves a solution coverage of 0.878 (87.8%) and consistency of 0.803. The joint presence of emotional intelligence and spiritual intelligence shows theoretically and empirically robust in predicting academic achievement. Also, high coverage suggests explanatory power and consistency confirms the configuration is reliably predict academic achievement under the observed conditions.

Table 8: intermediate solution

	Raw coverage	Unique coverage	consistency
EI	0.782397	0.0711581	0.850834
SI	0.806437	0.0951979	0.84376
Solution Coverage	0.877595		
Solution	0.803262		
Consistency			

Note: EI = emotional intelligence, SI = Spiritual intelligence

Complex solution

The complex solution was examined to provide conservative configurational assessment of sufficiency. Two sufficient configurations appear from the analysis. The first combination (EI*~SI) involves the presence of emotional intelligence and with the absence of spiritual intelligence. This configuration shows raw coverage of 0.456 (45.6%) of academic achievement, with unique coverage of 0.092 (9.2%). The consistency of 0.863 indicate the model is robust and reliably predicts academic achievement. The next configuration ~EI*SI joins the absence of emotional intelligence with presence of spiritual intelligence. They have a raw coverage of 0.495 (49.5%), explaining nearly half of the cases of academic achievement. Its unique coverage of 0.131 (13.1%), is attributable solely to this configuration. The consistency of 0.876 further confirms strong sufficiency. The solution coverage of 0.587 (58.7%) explains academic achievement. Further the

solution consistency of 0.836 exceeds internal reliability. The complex solution demonstrates equifinality and causal asymmetry; either the presence of emotional intelligence without spiritual intelligence or vice versa is sufficient to produce academic achievement. These patterns show a compensatory relationship between emotional intelligence and spiritual intelligence, as one can substitute for the other in generating academic achievement. This echoes configurational logic of FsQCA, which proposes that multiple distinct pathways lead to same outcome(Ragin, 2008).

Table 9: complex solution

	Raw coverage	Unique coverage	consistency
C_EI*~C_SI	0.456474	0.0919171	0.86264
~C_EI*C_SI	0.495163	0.130607	0.875838
Solution coverage	0.58708		
Solution consistency	0.83614		

Note: EI = emotional intelligence, SI = Spiritual intelligence

Discussions of results

The findings of this study reveal that emotional and spiritual intelligence contribute to academic achievement among students, supporting the view that, beyond cognitive ability, other dimensions of intelligence play a vital role in higher education (Parker et al., 2004; Nasir, 2010). Structural equation modelling reveals the interconnection between spiritual intelligence (SI) and emotional intelligence (EI) in predicting academic achievement among higher education students in Ghana. This forms the basis for a theoretical approach beyond cognitive academic achievement. Goleman (1995; Perera & DiGiacomo (2013), reported moderate variation of academic achievement, although spiritual intelligence and emotional intelligence on their own academic achievement is still unclear or inconclusive, yet important in educational success.

The results revealed that emotional intelligence had a significant positive effect on academic achievement, suggesting that it promotes higher education students' skills acquisition, mental skills, and complex physical activities which intend to increase academic success in the higher education context. Prior studies have shown emotional intelligence enhances academic resilience, and forecasts academic achievement among students in higher education through adapting to and establishing strategies with the learning environment (Amponsah, Adu-Gyamfi, et al., 2024; Cejudo et al., 2020; Ononye et al., 2022; Faradillah et al., 2022; Masrurroh et al., 2024; Rizal et al., 2024).

Additionally, emotional intelligence has had a strong positive impact on spiritual intelligence, indicating it do not only directly influence academic achievement but also indirectly enhances spiritual intelligence. The findings align with the idea that emotional intelligence is a type of social intelligence that deals with identifying of emotions, distinguishing emotions and utilising emotion to guide decision making (Salovey & Grewal, 2005; Goleman, 1995). Furthermore, the study agrees that emotional intelligence predicts spiritual intelligence which confirms with the idea that they are linked to influence growth among individuals in the community (Emmons, 2000; Wigglesworth, 2012).

With regards to spiritual intelligence, which was a significant predictor of academic achievement. These findings demonstrate that spirituality strengthens mental agility, critical thinking, creativity, and problem-solving ability, which are vital for students in academic achievement in higher education. According to (Hasanvand, 2020; Siddiqui & Khan, 2018; Abdollahi et al., 2019) spiritual intelligence enhances individual psychological well-being through sense of purpose, satisfaction, toughness and efficient coping with diverse strategies, helping students to manage academic stress and upholding motivation. The study showed that the positive effect of spiritual intelligence on academic achievement indicates it promotes academic success, engagement, and resilience resulting increased motivation and academic success among higher education students who are spiritually intelligent (Andriyani, 2023; Mawardi & Şen, 2023).

Therefore, emotional intelligence enhances spiritual intelligence, which indirectly increases academic achievement. Studies reported that both spiritual, emotional intelligence and cognitive intelligence combine can enhance students' academic success significantly (Taupik, 2025; Rizal et al., 2024). Again, spiritual intelligence acts as key initiator of academic achievement instead of the main motivator of academic success (Malik & Ahmad, 2024).

Although study's evidence supports the notion that emotional intelligence and spiritual intelligence are vital drivers of academic achievement, contrary to Silva & Almeida, (2023) who reported that emotional intelligence affected academic engagement but not academic achievement.

With moderate explanatory power of academic achievement, strong on spiritual intelligence, and an effect size demonstrating key relations with emotional intelligence on academic achievement, and a significant impact on spiritual intelligence. Sánchez-Álvarez et al. (2020) also reported moderate effect size on emotional intelligence. It confirms that spiritual intelligence and emotional intelligence promote academic achievement, with emotional intelligence serving basic rudiment to increase spiritual intelligence and academic achievement. Assessments of worldwide higher education often prioritizes cognitive and intellectual abilities while emotional intelligence and spiritual intelligence which has received attention. Ghana statistical service reported that 94.4% of people in Ghana are incline to spiritual beliefs thus pivotal in higher education students to achieve holistic education. Both hetrotrait-monotrait ratio and discriminant validity support distinct conceptual constructs jointly which foster spiritual intelligence as not overlap with emotional intelligence as reported by (King et al., 2012). In the current technological era, higher education students should not rely solely on cognitive abilities but also incorporate emotional and spiritual intelligence in their learning. Also, Zhou et al. (2024) reported that, for students in university to achieve academic excellence, emotional intelligence and spiritual intelligence should be treated independently as predictors. This focusses on introducing spiritual intelligence and emotional intelligence in the educational context, and on training faculties and programs to enrich the full potential of it.

Theoretical Implications

The study's findings support the idea that emotional intelligence and spiritual intelligence combine to influence students' academic achievement beyond cognitive abilities. This echoes emotional intelligence's impact on both spiritual intelligence and academics, reinforcing existing theories stating that emotional awareness, self-regulation, and motivation underpin the development of broader internal capacities that shape human functioning (Goleman, 1995; Emmons, 2000). The

large effect size of emotional intelligence on spiritual intelligence suggests that these intelligences are interconnected rather than isolated. The study expands the notion of academic achievement by examining multidimensionality and configurational factors in shaping non-cognitive intelligence. The findings expand on the symmetrical and asymmetrical aspect of emotional intelligence and spiritual intelligence, examining their variance explaining academic achievement as a functional condition for core condition rather than mere correlation.

These findings support Salovey & Mayer (1990) ability-based emotional intelligence and Emmons (2000) spiritual intelligence indicate not an independent predictive effect, but configurational and compensatory dynamics between them. Emotional intelligence works as a regulatory basis or rudiment through spiritual intelligence progress, while spiritual intelligence functions as a meaning-making in motivational structure of compensating for weaker emotional abilities. In higher education in Ghana non-cognitive support the notion of an integrative nature and non-hierarchical idea of intelligence. Also, it is one of the first studies in African to integrate emotional intelligence and spiritual intelligence through configuration in higher education.

The equifinality pathways demonstrate that emotional intelligence and spiritual intelligence are compensatory factors, supporting intelligence as integrative rather hierarchical in shaping academic achievement. This study demonstrates how integrating PLS-SEM and FsQCA by providing methodological complementarity. Specifically, its SEM clarifies directional effects and explanatory variance, while FsQCA reveals configurational sufficiency and causal asymmetry. Together these methods strengthen both theoretical and explanatory power.

Practical implications

The findings, higher education should move beyond predominantly cognitive assessments and intentionally integrate emotional and spiritual intelligence into its assessment and curriculum frameworks. This involves focusing on self-awareness, meaning-making, empathy, value-based discussions, mentorship, mindfulness, regulation of emotion and adaptive strategies. Again, institutions should adopt a differentiated strategy with homogenous interventions tailored to students' development needs in either spiritual or emotional intelligence. To support this, the Ghana tertiary council should implement a quality assurance model for these competencies to foster holistic education, reduce academic burnout, and enhance institutional achievement.

Additionally, there is an urgent need to incorporate holistic education for the development of students in higher educational institutions in Ghana during teaching and learning activities. Higher education in Ghana currently offers assessment modes that heavily rely on cognitive intelligence, leaving emotional and spiritual intelligences, although both are also predictive of academic achievement. In the meantime, higher education institutions should incorporate emotional intelligence, self-awareness, meaning-making, resilience, and reflective practices into their curricula to improve educational engagement and academic achievement.

The study advocates adopting student development frameworks in Ghana's higher education institutions. Higher education institutions should integrate non-cognitive skills, such as spiritual, emotional, psychological, and character-based competencies, into their educational policies and national quality assurance standards. This alignment with global higher education reforms, underscoring the importance of psychological and social skills, aims to enhance student success, reduce stress, promote well-being, and improve institutional performance.

Limitations of the study

In the context of the findings, the data was collected at a single in time because the intelligence and achievement measures used cross-sectional design. Due to social desirability bias, the common method bias in self-reporting can sometimes overestimate relationships. The study's generalizability is limited by sample characteristics of a single institution. Future studies should utilise multi-source data to confirm the findings and longitudinal study.

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Ethical approval: Ethical clearance was obtained from the research ethics committee of Kwame Nkrumah University, Science and Technology Kumasi, Humanities and Social Sciences Research Ethics Committee with function ref. HuSSREC/AP/260/VOL.4. Ethical approval was obtained (where applicable), and participants' rights and Confidentiality were duly respected following institutional and international research ethics standards.

Consent to participate: All procedures performed in this study involving human participants were following the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. The study was approved by the research ethics committee of Kwame Nkrumah University, Science and Technology Kumasi, Humanities and Social Sciences Research Ethics Committee with ref. HuSSREC/AP/260/VOL.4. Written and online informed consent was obtained from individuals taking part in the study for publication.

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Reference

- Abidin, Z., Mahfooz, A., Sulaiman, F., & Fauzi, H. (2024). Humanistic Approach in Islamic Education: Building Emotional and Spiritual Intelligence in the Digital Age. *Zabags International Journal of Islamic Studies*, 1(1), 29–35. <https://doi.org/10.61233/zijis.v1i1.5>
- Ahang, A. (2014). *The Relationship Between Spiritual Intelligence And Anxiety Mediate The Religious Attitude In Undergraduate Students Of Islamic Azad University* , . 4, 977–989.

- Ahmad, M., Ali, A., & Tariq, B. (2019). Emotional Intelligence, Library Use and Academic achievement of University Students. *Journal of the Australian Library and Information Association*, 68(1), 38–55. <https://doi.org/10.1080/24750158.2019.1572482>
- Amponsah, K. D., Adu-Gyamfi, K., Awoniyi, F. C., & Commey-Mintah, P. (2024). Navigating academic performance: Unravelling the relationship between emotional intelligence, learning styles, and science and technology self-efficacy among preservice science teachers. *Heliyon*, 10(9), e29474. <https://doi.org/10.1016/j.heliyon.2024.e29474>
- Amponsah, K. D., Salifu, I., Yeboah, R., & Commey-Mintah, P. (2024). Emotional intelligence and academic performance: how does the relationship work among pre-service teachers in Ghana? *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2024.2305557>
- Andriyani, J. (2023). *The Role Of Spiritual Intelligence On Achievement Motivation*. 08, 221–229. <https://doi.org/10.22373/psikoislamedia.v8i2.20322>
- Anwar, S., & Rana, H. (2024). Spiritual intelligence and psychological wellbeing of Pakistani University students. *Current Psychology*, 43(6), 5388–5395. <https://doi.org/10.1007/s12144-023-04717-8>
- Bereded, D. G., Abebe, A. S., & Negasi, R. D. (2025). Emotional intelligence and academic achievement among first-year undergraduate university students: the mediating role of academic engagement. *Frontiers in Education*, 10(March), 1–15. <https://doi.org/10.3389/feduc.2025.1567418>
- Cejudo, J., Losada, L., & Feltrero, R. (2020). Promoting social and emotional learning and subjective well-being: Impact of the “aislados” intervention program in adolescents. *International Journal of Environmental Research and Public Health*, 17(2). <https://doi.org/10.3390/ijerph17020609>
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. Modern methods for business research. *Statistical Strategies for Small Sample Research*, January 1998, 295–336. <http://books.google.com.sg/books?hl=en&lr=&id=EDZ5AgAAQBAJ&oi=fnd&pg=PA295&dq=chin+1998+PLS&ots=47qb7ro0np&sig=rihqbibvt6s-Lsj1H9txe9dX6Zk#v=onepage&q&f=false>
- Clark, T. O. M., Foster, L., Sloan, L., & Bryman, A. (2021). *BRYMAN ' S SOCIAL RESEARCH METHODS* (Edition, S).
- Creswell, J. W., & Plano Clark, V. L. (2018). Qualitative Inquiry & Research Design - Mixed Methods Research. In *Qualitative Inquiry & Research Design - Mixed Methods Research*.
- Creswell, J. W., & Creswell, J. D. (2018). Mixed Methods Procedures. In *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*.

- Creswell, J. W., & Creswell, J. D. (2023). Research Design, Qualitative, Quantitative and Mixed Methods Approaches. In *SAGE Publications, Inc.: Vol. Sixth Edit* (Issue 1). <https://medium.com/@arifwicaksanaa/pengertian-use-case-a7e576e1b6bf>
- Creswell, J. W., & Inoue, M. (2025). A process for conducting mixed methods data analysis. *Journal of General and Family Medicine*, 26(1), 4–11. <https://doi.org/10.1002/jgf2.736>
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The Impact of Enhancing Students' Social and Emotional Learning: A Meta-Analysis of School-Based Universal Interventions. *Child Development*, 82(1), 405–432. <https://doi.org/10.1111/j.1467-8624.2010.01564.x>
- Emmons, R. A. (2000). Is spirituality an intelligence? Motivation, cognition, and the psychology of ultimate concern. *International Journal of Phytoremediation*, 21(1), 3–26. https://doi.org/10.1207/S15327582IJPR1001_2
- Faradillah, S. N., Sumiati, A., & Fauzi, A. (2022). *Achievement in Financial Accounting Subject Grade Xi*. 629–637.
- Fiss, P. C. (2011). Building Better Causal Theories: A Fuzzy Set Approach to Typologies in Organization Research. *Academy of Management Journal*, 54(2), 393–420. <https://doi.org/10.5465/amj.2011.60263120>
- Ghosh, S. M. (2014). Emotional Intelligence and Academic Achievement among Advantage and Disadvantage Children. *International Journal of Indian Psychology*, 2(1). <https://doi.org/10.25215/0201.070>
- Goleman, D. (1995). *MOTIONAL INTELLIGENCE: WHY IT CAN MATTER MORE THAN IQ*. Bantam Books. <https://books.google.com.gh/books?Id=XP5GAAAAMAAJ>
- Herrera, L., Al-Lal, M., & Mohamed, L. (2020). Academic Achievement, Self-Concept, Personality and Emotional Intelligence in Primary Education. Analysis by Gender and Cultural Group. *Frontiers in Psychology*, 10(January), 1–13. <https://doi.org/10.3389/fpsyg.2019.03075>
- Joshi, J. (2019). Spiritual intelligence , competence and academic achievement of research scholars : a review study. *International Journal of Social Sciences*, 7(41948), 701–703.
- K. Sneha, & Gowri, B. (2016). *A Study on Spiritual Intelligence and Mental Health among University Students* 濟無No Title No Title No Title. 4(1), 1–23.
- King, D. B., Mara, C. A., & De Cicco, T. L. (2012). Connecting the spiritual and emotional intelligences: Confirming an intelligence criterion and assessing the role of empathy. *International Journal of Transpersonal Studies*, 31(1), 11–20. <https://doi.org/10.24972/ijts.2012.31.1.11>

- Maccann, C., Jiang, Y., Brown, L. E. R., Bucich, M., Double, K. S., & Minbashian, A. (2020). Emotional Intelligence Predicts Academic Performance: A Meta-Analysis. *Psychological Bulletin*, 146(2), 150–186. <https://doi.org/10.1037/bul0000219>
- Maccann, C., Jiang, Y., Brown, L. E. R., Double, K. S., Bucich, M., & Minbashian, A. (2019). Emotional Intelligence Predicts Academic Performance: A Meta-Analysis. *Psychological Bulletin*, 0000219, 1–98. <https://doi.org/10.1037/bul0000219>
- Malik, A., & Ahmad, I. (2024). *International Journal of Research Publication and Reviews* *Spiritual Intelligence as a Predictor of Academic Excellence : A Review Study Among Senior Secondary Students*. 5, 3884–3886.
- Masruroh, D. N., Rahmawati, L., Fakhurriana, R., Chalimah, C., & Fajarina, M. (2024). The Effect of Emotional Intelligence on Student Learning Achievement. *IERA, Islamic Education and Research Academy*, 5(1), 28–36. <https://doi.org/10.59689/iera.v5i1.1522>
- Mawardi, I., & Şen, A. (2023). *The Influence of Spirituality on Academic Engagement through Achievement Motivation and Resilience I*. 4(2), 314–326.
- Mohebi, S., Parham, M., Sharifirad, G., & Gharlipour, Z. (2018). *The mediating role of emotional intelligence in the relationship between learning motivation and academic outcomes: Conditional indirect effect of gender*. January, 1–6. <https://doi.org/10.4103/jehp.jehp>
- Nasir, M. (2010). An exploration of emotional intelligence of the students of IIUI in relation to gender, age and academic achievement. *Bulletin of Education and Research*, 32(1), 37–51. http://results.pu.edu.pk/images/20-07-11-journal/ier/PDF-FILES/3-Revised_Article.pdf
- Negi, A. S., & Khanna, A. (2017). An Inquiry on the Dimensions of Spiritual Intelligence. *International Journal of Development Research*, 07(09), 15169–15176.
- Nieto-Carracedo, A., Gómez-Iñiguez, C., Tamayo, L. A., & Igartua, J. J. (2024). Emotional Intelligence and Academic Achievement Relationship: Emotional Well-being, Motivation, and Learning Strategies as Mediating Factors. *Psicologia Educativa*, 30(1), 67–74. <https://doi.org/10.5093/psed2024a7>
- Ononye, U., Ogbeta, M., Ndudi, F., Bereprebofa, D., & Maduemezia, I. (2022). Academic resilience, emotional intelligence, and academic performance among undergraduate students. *Knowledge and Performance Management*, 6(1), 1–10. [https://doi.org/10.21511/kpm.06\(1\).2022.01](https://doi.org/10.21511/kpm.06(1).2022.01)
- Parker, J. D. A., Summerfeldt, L. J., Hogan, M. J., & Majeski, S. A. (2004). Emotional intelligence and academic success: Examining the transition from high school to university. *Personality and Individual Differences*, 36(1), 163–172. [https://doi.org/10.1016/S0191-8869\(03\)00076-X](https://doi.org/10.1016/S0191-8869(03)00076-X)

- Perera, H. N., & digiacomo, M. (2013). The relationship of trait emotional intelligence with academic performance: A meta-analytic review. *Learning and Individual Differences*, 28, 20–33. <https://doi.org/10.1016/j.lindif.2013.08.002>
- Qualter, P., Gardner, K. J., Pope, D. J., Hutchinson, J. M., & Whiteley, H. E. (2012). Ability emotional intelligence, trait emotional intelligence, and academic success in British secondary schools: A 5year longitudinal study. *Learning and Individual Differences*, 22(1), 83–91. <https://doi.org/10.1016/j.lindif.2011.11.007>
- Ragin, charles c. (2008). *Redesigning Social Inquiry : Fuzzy Sets and Beyond*.
- Raheja, S., Gupta, R., & Yadav, G. (2024). Spiritual Intelligence, happiness and success of students in select higher education institutions of University of Delhi. *Environment and Social Psychology*, 9(6), 1–15. <https://doi.org/10.54517/esp.v9i6.1984>
- Ramachandaran, S. D., Krauss, S. E., Hamzah, A., & Idris, K. (2017). Effectiveness of the use of spiritual intelligence in women academic leadership practice. *International Journal of Educational Management*, 31(2), 160–178. <https://doi.org/10.1108/IJEM-09-2015-0123>
- Ratnawat, R. G. (2023). Spiritual Intelligence and Academic Performance of Students: A Review of Literature. *The Online Journal of Distance Education and E-Learning*, 11(2), 1643–1647.
- Rihoux, B. (2006). Qualitative comparative analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research. *International Sociology*, 21(5), 679–706. <https://doi.org/10.1177/0268580906067836>
- Rizal, R. M., Sobarna, A., Ediansyah, & Alpen, J. (2024). Integrating intellectual, emotional, and spiritual intelligence to enhance academic achievement in pencak silat. *Journal Sport Area*, 9(3), 468–479. [https://doi.org/10.25299/sportarea.2024.vol9\(3\).16343](https://doi.org/10.25299/sportarea.2024.vol9(3).16343)
- Salovey, P., & Grewal, D. (2005). The science of emotional intelligence. *Current Directions in Psychological Science*, 14(6), 281–285. <https://doi.org/10.1111/j.0963-7214.2005.00381.x>
- Sánchez-Álvarez, N., Berrios Martos, M. P., & Extremera, N. (2020). A Meta-Analysis of the Relationship Between Emotional Intelligence and Academic Performance in Secondary Education: A Multi-Stream Comparison. *Frontiers in Psychology*, 11(July), 1–11. <https://doi.org/10.3389/fpsyg.2020.01517>
- Schneider, C. Q., & Wagemann, C. (2012). Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis. In *Strategies for Social Inquiry*. Cambridge University Press. <https://doi.org/DOI: 10.1017/CBO9781139004244>
- Silva, A. J., & Almeida, N. (2023). Can engagement and performance be improved through online training on emotional intelligence? A quasi-experimental approach. *International Journal of Educational Management*, 37(2), 449–464. <https://doi.org/10.1108/IJEM-03-2022-0092>

Taupik, M. (2025). The Influence of Spiritual Intelligence, Emotional Intelligence, and Intellectual Intelligence towards Student Learning Achievement. *Journal of English Language and Education*, 10(2), 33–41.

Ubago-Jimenez, J. L., Zurita-Ortega, F., Ortega-Martin, J. L., & Melguizo-Ibañez, E. (2024). Impact of emotional intelligence and academic self-concept on the academic performance of educational sciences undergraduates. *Heliyon*, 10(8).
<https://doi.org/10.1016/j.heliyon.2024.e29476>

Zhou, Z., Tavan, H., Kavarizadeh, F., Sarokhani, M., & Sayehmiri, K. (2024). The relationship between emotional intelligence, spiritual intelligence, and student achievement: a systematic review and meta-analysis. *BMC Medical Education*, 24(1), 1–10.
<https://doi.org/10.1186/s12909-024-05208-5>