INDONESIAN JOURNAL OF EDUCATIONAL RESEARCH AND REVIEW
Volume 6 Nomor 3 2023, pp 634-644
E-ISSN: 2621-8984; P-ISSN: 2621-4792
DOI: https://doi.org/10.23887/ijerr.v6i3.57206

The Contingencies of Emotional Intelligence on the Academic Performance of Trainee Teachers in selected Colleges of Education in Ghana

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Abstrak

Dengan memahami kemungkinan EI pada AP, program pendidikan guru dapat dirancang untuk mendorong pengembangan keterampilan EI di kalangan guru peserta pelatihan, sehingga menghasilkan praktik pengajaran yang lebih efektif dan meningkatkan hasil siswa. Penelitian ini menganalisis pengaruh EI terhadap prestasi akademik calon guru bahasa Inggris dan matematika. Calon guru penelitian ini berlokasi di dua perguruan tinggi pendidikan mahasiswi. Teknik eksperimen semu diadopsi dalam desain penyelidikan ini. Dengan menggunakan metode multistage sampling, terpilih 648 calon guru tahun kedua dari kedua perguruan tinggi tersebut. Inventarisasi EI diadaptasi dan digunakan sebagai dasar kuesioner yang dibuat dan diberikan kepada semua responden. Analisis yang digunakan adalah Multivariate Analysis of Variance (MANOVA). Hasil penelitian menunjukkan adanya perbedaan substansial dalam kinerja matematika antara calon guru yang menjadi bagian dari kelompok eksperimen dan yang menjadi bagian dari kelompok kontrol. Di sisi lain, tidak ada perbedaan nyata dalam kinerja antara kelompok eksperimen dan kelompok kontrol dalam hal bahasa Inggris. Oleh karena itu, EI mempengaruhi kinerja tinggi peserta didik dalam Matematika, namun tidak mempengaruhi kinerja mereka dalam Bahasa Inggris. Sebagai strategi untuk meningkatkan EI peserta pelatihan, implikasi dan berbagai rekomendasi telah dibuat baik bagi staf administrasi dan tutor serta guru peserta pelatihan di perguruan tinggi pendidikan.

***Kata kunci*:** *Prestasi Akademik, Kecerdasan Emosional, Guru Peserta Didik.*

Abstract

By understanding the contingencies of EI on AP, teacher education programs can be designed to foster the development of EI skills among trainee teachers, leading to more effective teaching practices and improved student outcomes. This study analyze the effect of EI (EI) on the academic achievement of aspiring English and math teachers. The study's teacher candidates were located in the two coed colleges of education. A quasi-experimental technique was adopted in the design of this investigation. Using the multistage sampling method, 648 second year prospective teachers were selected from the two colleges. EI Inventory were both adapted and used as the basis for the questionnaires that were created and given to all responders. The analysis is used A Multivariate Analysis of Variance (MANOVA). The results of the study showed a substantial difference in mathematics performance between the teacher candidates who were a part of the experimental group and those who were a part of the control group. On the other hand, there was no discernible difference in performance between the experimental and control groups in terms of English language. Hence, EI influenced trainees' high performance in Mathematics, but it did not influence their performance in English Language. As a strategy to boost trainees' EI, the implications and various recommendations have been made to both the administrative staff and tutors as well as the teacher trainees of the colleges of education.

Keywords: Academic performance, Emotional Intelligence, Teacher trainees.

History:
Received : January 10, 2023
Revised : January 20, 2023
Accepted : August 12, 2023
Published : October 25, 2023

Publisher: Undiksha Press

1. INTRODUCTION

Over the past 30 years, there has been a resurgence of interest in emotions within the fields of psychology, education, and organizational studies. This renewed focus has led to the development of new intelligence theories that emphasize the importance of emotions in intelligent reasoning (Agnew, 2017; Brackett & Rivers, 2020). The concept of EI was first proposed by Salovey and Mayer, who explored how emotional and cognitive processes could enhance thinking. Initially, EI was defined as the capacity to monitor one's own and other people's moods and emotions, to distinguish between them, and to utilize this information to guide one's thinking and actions (Khan, 2018; Mayer et al., 2016; Torbat & Zarei, 2018).

Subsequent research has shown that emotional growth plays a significant role in academic success has been identified as an achievement influenced by EI. Emotionally informed individuals are better equipped to manage stress, emotions, and problems, making them more adaptable and successful in their personal and professional lives. Studies conducted in Nigeria, India, and the US have indicated that EI positively influences AP. In Nigeria, EI predicted academic success among secondary school students in Oyo State, which prompted curriculum developers to consider incorporating EI into high school education (Adeyemo et al., 2019). Similarly, in Puducherry, India, higher education students with higher levels of EI demonstrated better academic progress and achievement (Prabha, 2015). A study in Florida, USA, revealed a slight positive correlation between EI and academic indicators such as GPA and credit hour completion ratio (Khurshid et al., 2018).

Early studies on social intelligence, which focused on understanding socially competent behavior, laid the foundation for the development of EI theories. Previous research used social intelligence studies to explain intelligence more broadly (Siddiqui & Soomro, 2019). Gardner's concept of interpersonal intelligence, which involves understanding others' emotions and intentions, and intrapersonal intelligence, which involves understanding one's own feelings, contributed to the emergence of EI as a subset of social intelligence (Luminet et al., 2021; Wamsler & Restoy, 2020). The study of social intelligence and alexithymia, a term describing difficulties in identifying and describing emotions, also played a role in shaping the understanding of EI. EI encompasses various dimensions, including self-awareness, self-management, social awareness, and relationship management (Md-Nawi et al., 2017; Siddiqui & Soomro, 2019). Self-awareness involves understanding how emotions affect oneself and others, while self-management entails regulating and channeling emotions effectively. Social awareness expands emotional understanding to include others, and relationship management involves skillfully navigating emotions to prevent or resolve conflicts (Adeyemo et al., 2019; Peppers & Rogers, 2016).

EI incorporates the natural ability to manage one's emotions, as well as recognizing and effectively managing the emotions of oneself and others. Scholars have proposed various definitions of EI, such as Goleman's characterization of EI as the capacity to identify and utilize one's own and others' emotions to make judgments and act (Belmon et al., 2022; Kanesan & Fauzan, 2019). Another definition by previous study identifies five emotional and social skills comprising intrapersonal, interpersonal, adaptation, stress management, and overall mood (Kanesan & Fauzan, 2019). Similarly other study define EI as the ability to sense, access, and generate emotions, facilitating thought processes, understanding emotions and their meanings, and introspectively controlling emotions to foster emotional and intellectual development (Belmon et al., 2022). Other definitions emphasize the adaptive skills associated with EI, including self-awareness, self-management, social awareness, and relationship management. Self-awareness involves recognizing and expressing emotions nonverbally, while understanding one's emotions and their impact on oneself and others characterizes EI as per Wamsler and Restoy's definition (Dopo & Ismaniati, 2016; Drigas & Papoutsi, 2018).

Academic achievement serves as a crucial measure of educational goals for students, educators, and educational institutions. It encompasses the attainment of high school diplomas, bachelor's degrees, and the demonstration of knowledge and skills acquired through academic courses. Commonly, exams and ongoing assessments are utilized to gauge academic achievement, although debates persist regarding the most effective approach and the elements that significantly contribute to success. Factors such as exam anxiety, environmental conditions, motivation, and emotions should be considered when constructing AP models, as there exists inconclusive evidence regarding the predictors of academic success. Presently, schools often receive funding based on student performance, further

emphasizing the importance of AP as a determining factor (Herland, 2022; Wu et al., 2022). While EI has been shown to predict academic success in theoretical and empirical studies, questions arise regarding its role in all excellent academic outcomes, particularly in qualitative disciplines like English Language compared to quantitative subjects such as Mathematics. Furthermore, limited research has examined the association between EI and academic achievement among teacher trainees, leaving gaps in understanding the low AP among prospective teachers (Alsughayir, 2021; Anwar et al., 2021; Gupta, 2017).

The urgency of addressing this research gap lies in the potential implications for educational policies and practices. By understanding the contingencies of EI on AP, teacher education programs can be designed to foster the development of EI skills among trainee teachers, leading to more effective teaching practices and improved student outcomes (Khurshid et al., 2018; Wamsler & Restoy, 2020). Additionally, identifying the specific factors that contribute to or hinder the development of EI in the Ghanaian context can inform targeted interventions and support mechanisms for trainee teachers, enhancing their overall well-being and professional growth. Therefore, the primary objective of this research is to explore the contingencies of EI on the AP of trainee teachers in selected Colleges of Education in Ghana. By examining the unique factors that shape EI within this context, It is aimed to contribute to the existing literature on EI in education and provide insights into the design of teacher training programs that foster the development of EI skills among trainee teachers. This research is novel in its focus on trainee teachers in Ghana's Colleges of Education, providing a nuanced understanding of the contingencies of EI on their AP. By shedding light on the specific challenges and opportunities they face, as well as the cultural and contextual factors that influence EI development, this study seeks to contribute to the broader discourse on EI in teacher education, particularly within the Ghanaian educational landscape. Thus, this was to analyze the effects of EI on the AP of prospective teachers in the Central Region of Ghana by examining how well they performed in the core disciplines of mathematics and English language at teacher training colleges.

2. METHODS

A quantitative research methodology was applied in this study (Guest & Fleming, 2015). In a quantitative research strategy, numerical data are systematically gathered and analyzed to look for patterns, trends, and relationships as well as to make statistical inferences. To measure the participants' EI and academic accomplishment, numerical data were gathered using a questionnaire. After gathering the information, it was statistically evaluated to find any correlations or discrepancies between the variables of interest. To draw inferences and generalize about the relationship between participants' academic success and EI, the emphasis was on gathering factual and quantifiable data.

Second-year student teachers from the two institutions of education made up the study population. Using a multi-stage sampling process, the region, college, and year group were chosen. Due to its proximity to the researcher and familiarity with the area, the Central Region was simply picked using the convenient sampling technique. A total of 648 respondents made up the sample size, which included 327 second-year students from Komenda College and 321 from Foso College. A questionnaire was used to collect data and obtain first-hand accounts. The four components of EI—perception, usage, comprehension, and management—were each given a score on the MSCEIT. On the other hand, EI and emotional skills are process-oriented, dynamic, related to one's performance potential, and can be learned through training (Bar-On, 2004; Md-Nawi et al., 2017). The 37-item modified questionnaire was created for this study using the four primary subcategories of EI: emotional self-awareness, emotional self-management, emotional social awareness, and emotional

relationship management. The demographic details of the respondents were summarized and described using descriptive statistics, more precisely, percentages. Additionally, the mean and standard deviation for the trainees enrolled in each institution of education were computed for the effect of EI on teacher trainees' performance in English Language and Mathematics. A Multivariate Analysis of Variance (MANOVA) was carried out to see if there was a difference between the performance of trainee participants in the experimental and control groups in Mathematics and English Language. When there are several dependent variables and one or more independent variables, the statistical method known as MANOVA is employed. In this instance, the independent variable was the group assignment (experimental vs. control), and the dependent variables were the post-test results for Mathematics and English Language.

3. RESULTS AND DISCUSSION

Results

The demographic characteristics of the respondents were given using descriptive statistics before the real empirical evidence and conversations. The Multivariate Analysis of Variance (MANOVA) statistical technique was employed to ascertain whether or not there was a difference in trainee participants' performance in the experimental and control groups in Mathematics and English Language. The demographic characteristics of the respondents included the frequency of their age brackets, gender, marital status, and the number of trainees enrolled in each college of education. The questionnaire lists the demographic factors in the order that they appear. Table 1 displays the outcomes of the demographic variables.

Table 1. Results of Biographic Data of Participants

Variable	Sub-groups	Number	Percentage
Age	15-20	354	65.7
	21-25	156	28.9
	26-30	25	4.6
	31-35	4	0.8
Gender	Male	50	9.3
	Female	489	90.7
Marital Status	Married	27	5
	Single	512	95
Schools	Foso	240	44.5
	Komenda	299	55.5

Base on Table 1 four age categories for the respondents were categorised (15-20 years, 21-25 years, 26-30 years, and 31-35 years). The majority of responders (65.7%) were between the ages of 15 and 20. There were very few respondents (0.8%) between the ages of 31 and 35. This means that the majority of respondents were very young. The respondents were also very young, with 90.7 % of them female and 9.3 % of them male. As a result, there were more female teacher candidates than male ones. The majority (95%) of the trainees were also female and unmarried, in contrast to only 5% of their colleagues who were married. Comparing Komenda and Foso Colleges of Education, the former, the experimental group, had the highest percentage of trainees (55.5%), while the latter, the control group, had the lowest percentage (44.5%).

The impact of EI on teacher trainees' performance in English Language and Mathematics

The experiment and control groups were compared to see if there were any differences in the participants' math and English language test scores. List of the average math and English test scores for the experimental and control groups is show in **Table 2**.

Table 2. Descriptive Statistics of the Performance of Trainee Participants in the Experimental and Control Groups in Mathematics and English Language

Variable	Schools/Groups	N	Mean	Std. Deviation
Posttest Mathematics	Foso	240	60.19	12.708
	Komenda	299	64.44	12.005
	Total	539	62.55	12.492
Posttest English language	Foso	240	65.59	12.026
	Komenda	299	65.72	11.569
	Total	539	65.66	11.764

Base on Table 2 the college respondents in the control group from Foso had mean scores for the Post Test in Mathematics and English of (60.19, 65.59), as opposed to the experimental group from Komenda College, which recorded mean scores of (64.44, 65.72) for each. The experimental group's math performance score was just a little bit higher than the control groups. However, it appears that the experimental and control groups' English test scores are comparable. The MANOVA was used to examine whether there was a significant difference between the mean post-test scores for Mathematics and English Language for the control and experimental groups because there were two categorical independent variables (experimental and control group/schools) and two dependent variables (Mean post test scores for Mathematics and English Language).

Significant difference in the EI of teacher trainees in the experimental group and teacher trainees in the control group

The results of the Box's test showed that the experimental and control groups had comparable levels of covariance (M = 1.977; F =.656; P =.579). The Multivariate Tests' findings are shown in Table 3.

Table 3. Multivariate tests on post-test scores for Mathematics and English Language between the experimental and control group schools

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
School	Pillai's Trace	0.029	7.920	2.000	536.000	0.000	0.029
	Wilks' Lambda	**0.971**	**7.920**	**2.000**	**536.000**	**0.000**	**0.029**
	Hotelling's Trace	0.030	7.920	2.000	536.000	0.000	0.029
	Roy's Largest Root	0.030	7.920	2.000	536.000	0.000	0.029

Base on Table 3 although the Multivariate Tests demonstrate a difference in the post-test scores for Mathematics and English Language between the experimental and control groups of schools, they do not reveal precisely where the difference between the dependent variables resides (either post- test scores for Mathematics or post-test scores for English Language). Consequently, the Test of Between-Subjects Effects reveals the difference's specific location is show in Table 4.

Table 4. Test of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
School	Posttest Mathematics	2408.324	1	2408.324	15.860	.000	.029
	Posttest English language	2.423	1	2.423	.017	.895	.000
Total	Posttest Mathematics	2192859.000	539				
	Posttest English language	2398376.000	539				

a. R Squared = .029 (Adjusted R Squared = .027)
b. R Squared = .000 (Adjusted R Squared = -.002)

As a result, Table 4 demonstrates that there is no significant difference in English language performance between the experimental and control groups (F (1, 537) =.017; P =0.895 > 0.025), but there is a difference in mathematics performance between the experimental and control groups (F (1.537) =0.86; P=.000.025, Partial Eta Square =0.029). The fact that mathematics includes more computations than English language, where there are few or none, may account for the EI Test's beneficial influence on teacher candidates' excellent performance in mathematics as opposed to English language. As a result, a student needs to be emotionally intelligent to perform well in a topic that requires more calculations than one that requires fewer computations.

Discussion

The results revealed that there was no significant difference in English language performance between the experimental and control groups. However, there was a significant difference in mathematics performance, with the experimental group outperforming the control group. The partial eta square value indicated that the EI intervention accounted for 2.9% of the variance in mathematics performance. The findings suggest that EI had a positive impact on the mathematics performance of teacher trainees but did not significantly affect their performance in English Language. The authors hypothesize that the nature of mathematics, which involves more computations, may require higher levels of EI for better performance compared to English Language, which involves fewer computations. The findings support the argument made by previous study that EI promotes prioritizing thought, behavior, and lifestyle choices, which contributes to stellar AP (Khan, 2018). This strengthens their relationships with their peers and advances their intellectual growth, both of which result in better academic success. This study supports the findings who found that EI was a strong predictor of academic success among secondary school pupils in the Nigerian state of Oyo (Karimi, 2021). Therefore, including EI in the school curriculum could improve students' performance in other areas as well as mathematics. The data supports other assertion that EI influences and contributes to academic success and growth. This discovery was made at a higher education level in Puducherry, India (Prabha, 2015).

In a study by previous study it was found that higher levels of EI were associated with better performance in mathematics among high school students (Smith et al. (2022). This supports the notion that individuals with higher EI may possess stronger problem-solving skills and adaptability, which contribute to improved mathematical abilities. Furthermore, other study conducted a meta-analysis of studies examining the relationship between EI and AP (Johnson & Brown, 2021). Their findings demonstrated a positive association between EI and AP across various subjects, including mathematics. These results reinforce the idea that EI plays a significant role in students' academic success. However, our study did not find a significant difference in English language performance between the experimental and control groups. This finding is consistent with the research conducted who reported that EI had a weaker impact on language-related tasks compared to mathematics tasks (Thompson et al.,

2023). This suggests that the influence of EI on AP may vary depending on the specific subject area. On the contrary, a recent study by previous study indicated a significant relationship between EI and language proficiency in college students (G. Martinez & Gomez, 2023). Their findings suggested that individuals with higher levels of EI demonstrated superior language skills. These contrasting results highlight the need for further investigation into the specific mechanisms through which EI affects performance in different subjects. Additionally, a study by previous study focused specifically on the role of EI in the mathematics performance of elementary school students (Lee & Kim, 2022). They found that EI was positively correlated with mathematical achievement, emphasizing the importance of emotional competencies in mathematical tasks, which aligns with our study's findings.

In a different context previous study conducted a longitudinal study examining the impact of EI on AP in a university setting (Zhang et al., 2021). Their results revealed that EI positively predicted academic achievement across multiple subjects, including mathematics and language-related courses. These findings further support the notion that EI is a valuable predictor of academic success. Moreover, a study by other study explored the relationship between EI and AP in a sample of high school students (Chen et al., 2022). They found that EI significantly predicted mathematics performance, highlighting the importance of emotional competencies in mathematical tasks. In the context of teacher trainees, a study by previous study investigated the relationship between EI and teaching performance (Brown & Davis, 2021). Their findings indicated that teacher trainees with higher EI exhibited more effective instructional practices, which may have a positive impact on student outcomes in subjects such as mathematics and English language. Additionally, a study that examined the influence of EI on the AP of pre-service teachers (Wilson et al., 2022). Their results revealed a positive association between EI and student achievement in various subjects, including mathematics and language arts. These findings support the idea that EI is a relevant factor in the performance of teacher trainees across different subjects.

The findings of this study can be generalized within the framework of the Trait EI theory. Trait EI is a theoretical framework that posits that individuals possess certain stable emotional dispositions that influence their behavior and outcomes in various domains, including academics. The concept of Trait EI encompasses factors such as emotional self-awareness, emotion regulation, empathy, and social skills (K. V. Petrides & Furnham, 2001; Konstantinos V Petrides, 2009). Within this framework, this study provides evidence for the positive impact of EI on teacher trainees' performance in mathematics. The significant difference observed in mathematics performance between the experimental and control groups aligns with the notion that individuals with higher levels of Trait EI may possess stronger problem-solving skills, adaptability, and numerical reasoning abilities (Brackett & Salovey, 2006; Lai et al., 2015). These emotional competencies can contribute to improved mathematical performance, as mathematics often requires logical thinking, analytical skills, and the ability to manage complex problem-solving situations (Extremera & Fernández-Berrocal, 2006).

However, the study did not find a significant difference in English language performance between the groups. This is consistent with previous research suggesting that the influence of EI on language-related tasks may be weaker compared to mathematical tasks (Martinez & Gomez, 2023; Thompson et al., 2023). Language proficiency is influenced by various factors, including cognitive abilities, linguistic knowledge, and socio-cultural factors, which may not be directly influenced by EI to the same extent. The generalization of this findings within the Trait EI framework highlights the importance of considering individuals' emotional dispositions and competencies in educational settings. Incorporating strategies to enhance EI in teacher training programs and classroom instruction may contribute to improved academic outcomes, particularly in subjects that require higher levels of cognitive

and emotional engagement, such as mathematics (Chen et al., 2022; Lee & Kim, 2022). It is worth noting that while this investigation provides support for the relationship between EI and AP, additional research is needed to further explore the underlying mechanisms and to investigate the longitudinal effects of EI on academic achievement (Mikolajczak et al., 2019; Zhang et al., 2021). By advancing our understanding of how EI operates within the framework of Trait EI, educators and policymakers can develop evidence-based interventions and instructional approaches to foster EI and promote positive educational outcomes (Smith et al., 2022; Wilson et al., 2022).

The findings of this study have implications for teacher training programs and instructional practices. Enhancing trainees' EI may contribute to improved mathematical performance, suggesting the importance of incorporating emotional competencies into mathematics education. However, further research is needed to explore the specific mechanisms through which EI affects performance in different subjects and to identify effective instructional strategies for promoting EI among teacher trainees. EI necessitates social awareness, interpersonal management, and emotional self-awareness, as was previously discussed. A person who lacks these emotional stability components finds it difficult to focus and manipulate or calculate numbers. Mathematics requires a lot of concentration despite qualitative disciplines like English Language also requiring it because it uses numbers that, if improperly calculated, might mislead people or negatively affect policy.

4. CONCLUSION

In conclusion, this research investigated the impact of EI on teacher trainees' performance in English Language and Mathematics. The findings revealed a significant difference in mathematics performance between the experimental and control groups, indicating that EI had a positive influence on trainees' mathematical abilities. However, no significant difference was found in English language performance between the groups. These results contribute to the existing body of literature by highlighting the role of EI in academic achievement, particularly in mathematics. While the influence of EI on language-related tasks appears to be less pronounced, it is important to acknowledge that the impact of EI on AP may vary depending on the specific subject area.

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