



Exploring Students' Emotional Quotient and Mathematics Performance in a Rural High School in The Philippines

Joanne Paul Lyn S. Bolaños^{1,2}, Ryan V. Dio¹

¹Graduate School, Sorsogon State University, Sorsogon City, Philippines

²Gubat National High School, Department of Education, Sorsogon Division, Philippines

ABSTRACT

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This study employed a descriptive-correlational design, using both qualitative and quantitative approaches, to determine the relationship between the Emotional Quotient (EQ) level of junior high school (JHS) students and their performance in Mathematics. Data was gathered from 315 junior high school students of Gubat National High School, Sorsogon, Philippines, for the school year 2023-2024. The instruments used were the Quick Emotional Intelligence Self-Assessment (QEISA) to measure the EQ levels of students across the four EQ domains—Emotional Awareness, Emotional Management, Social Emotional Awareness, and Relationship Management—and the Albay Numeracy Assessment Tool (ALNAT) to evaluate their mathematics performance. Researcher-designed interviews were also conducted to gain deeper insights into the factors influencing their performance. The data gathered underwent different statistical treatments like frequency count, mean, standard deviation, chi-square, coefficient contingency, and thematic analysis. The results reveal a significant, moderate relationship between the students' Relationship Management and a significant, low relationship in the Social Emotional Awareness, with their performance in Mathematics. Additionally, this study proposes EQ-based lesson exemplars for Grades 7 to 10 (JHS) Mathematics to address students' least-learned competencies and enhance their EQ. This research underscores the importance of integrating socio-emotional learning into educational practices to improve students' Mathematics performance.

KEYWORDS:

Emotional Quotient (EQ), EQ Domains, Mathematics Performance, Junior High School Students

1. INTRODUCTION

Mathematics poses a significant challenge for some students who consistently show low performance along with low motivation, interest, and self-confidence in the subject. (Aguilar, 2021; Suren, & Kandemir, 2020). Negative emotions like anxiety, frustration, and boredom also limit cognitive processes essential for doing well in math, which adds yet another layer of challenge to these obstacles (Dowker & Sheridan, 2022; Semeraro et. al., 2023; Melani, et al., 2023).

Recognizing the relationship between emotions and learning, it is essential to explore how emotional quotient (EQ) affects mathematics learning achievement. EQ, as defined by Goleman (1995), includes the ability to identify, understand, and regulate emotions in oneself and others. It plays a crucial

role in education, as students with higher EQ are better equipped to manage stress, frustration, and anxiety, common barriers to mathematical success (Goleman, 1995). Research has shown that EQ significantly correlates with academic performance. For instance, Diocos (2022) found that students with higher EQ demonstrated better mathematics performance due to improved resilience and stress management. Similarly, Ugwuanyi (2020) highlighted that EQ, alongside self-esteem and self-efficacy, is a strong predictor of students' achievement in mathematics. These findings emphasize the importance of fostering EQ in educational settings, particularly in subjects like mathematics, where it can enhance problem-solving and logical reasoning skills. Integrating EQ development into mathematics instruction can create a more supportive and effective learning environment, ultimately improving student outcomes.

Mathematics is a fundamental part of every school curriculum, shaping the way students think and approach challenges. Beyond numbers and equations, it helps develop essential life skills like critical thinking, problem-solving,

Corresponding Author: Joanne Paul Lyn S. Bolaños

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reasoning, and effective communication (Sosa-Gutierrez et al., 2024; Dio, 2020; Firdaus et al., 2015). When students engage with math, they learn how to break down complex problems, recognize patterns, and apply logical steps to find solutions. According to the National Council of Teachers of Mathematics (NCTM), strong problem-solving skills in math translate into real-world applications, preparing students to tackle everyday challenges with confidence. Moreover, Inglis et. al. (2017) highlight that studying mathematics enhances logical reasoning, a skill that benefits students not only academically but also in their future careers. By strengthening these cognitive abilities, mathematics plays a crucial role in shaping both academic success and professional aspirations. The 2018 Programme for International Student Assessment (PISA) reveals that the Philippines' mathematics performance was lower than the world average and among the weakest performers in Southeast Asia (OECD, 2019). The primary weaknesses of Filipino students were in reasoning, problem-solving skills, and the application of mathematical concepts. The latest analysis from the PISA discloses the need to respond to the concerns regarding the mathematics performance of Filipino students. The COVID-19 pandemic has only worsened these issues by hindering access to quality teaching and instructional materials necessary for effective learning (Philstar, 2024; Dio et.al, 2023). This disruption has led to increased stress and anxiety among students, negatively impacting their emotional well-being and learning outcomes (Odriozola-González et al., 2020). This information highlights the benefits and the necessity of using different strategies, including teaching emotional quotient, to improve math performance.

The stress and anxiety induced by the pandemic, coupled with the struggles in adapting to new learning environments, can negatively impact students' emotional well-being (Cao et al., 2020; Son et al., 2020). Lower EQ can lead to decreased motivation, increased frustration, and a lack of confidence in tackling mathematical problems (Fabregas et. al., 2025). Therefore, addressing the emotional aspects of learning is crucial. Enhancing students' EQ can improve their resilience, adaptability, and overall performance in mathematics, especially in the face of ongoing educational disruptions.

This study examined the relationship between EQ and students' performance in math, particularly in junior high school in Gubat, Sorsogon, one of the rural provinces in the Philippines, proposing strategies to integrate EQ development into classroom practices. When students develop skills such as emotional awareness and management, they can better handle the anxiety and pressure of mathematical tasks. Social-emotional awareness and relationship management can help students collaborate effectively, explore, and utilize group and individual problem-solving skills. In line with what PISA highlights as critical for success in mathematics, EQ development may therefore equip students with the cognitive flexibility and

persistence that ties students to the problem-solving aspect of mathematics.

The Department of Education (DepEd) has implemented various programs targeted at enhancing the mathematics performance of students. This includes the National Mathematics Program, training of teachers to improve their pedagogical approaches, and the revision of curricula under the MATATAG Curriculum aimed at developing critical foundational skills in numeracy. Furthermore, the Department of Education works with organizations like Khan Academy to make these resources available to learners, indicating an effort to raise the level of mathematics proficiency in the country (Philstar, 2023; DepEd, 2023).

Research has explored various strategies to improve mathematics education in the Philippines. For instance, Caraan et al. (2023) investigated the effectiveness of the Realistic Mathematics Education (RME) approach on students' problem-solving skills, and Aguhayon et al. (2023) examined the use of differentiated instruction to address learning gaps in mathematics. These studies, among others, provide valuable insights into effective approaches for enhancing mathematics education in the Philippines, complementing the efforts of DepEd and its partners.

Moreover, integrating EQ into education aligns with ongoing efforts by the DepEd to improve student well-being (DEPED, 2024). National Mental Health Program and Socio-Emotional Learning Programs are some of the indicators of this growing awareness of the need for mental and emotional skills in education. These programs, alongside the political will to enhance the existing school-based mental health services, create a conducive environment for the adoption and implementation of EQ-based programs.

Hence, this study seeks to contribute to the growing body of literature on the role of emotional quotient in academic success. The research aims to provide practical insights for educators, parents, and policymakers by exploring the specific relationship between EQ and mathematics performance. Enhancing EQ among junior high school students may improve their mathematical abilities and foster holistic personal development, equipping them with the skills needed for lifelong learning and success.

Objectives

This study determined the level of Emotional Quotient of Junior High School students in Sorsogon, Philippines, concerning their Mathematics performance. Specifically, it answered the following questions:

1. What is the level of emotional quotient of the junior high school students based on the following emotional domains:
a. Emotional Awareness, b. Emotional Management, c. Social Emotional Awareness, and d. Relationship Management?
2. What is the performance level of the students in Mathematics when grouped according to their emotional quotient?

3. Is there a significant relationship between the students' emotional quotient and their performance in Math?
4. What lesson exemplars in mathematics that integrate EQ domains may be proposed?

Hypotheses

The hypothesis will be tested at a 0.05 significance level:

Alternative Hypothesis (Ha): There is a significant relationship between students' emotional quotient and their performance in Mathematics.

Null Hypothesis (Ho): There is no significant relationship between students' emotional quotient and their performance in Mathematics.

CONCEPTUAL FRAMEWORK

The concept of how this study was undertaken utilized the system approach, in which parts are interdependent. The conceptual framework in Figure 1 shows the clear connection between the students' emotional quotient and their academic performance in Mathematics. The system interrelated input, output, and feedback which are its major parts. It also illustrates the flow of the study.

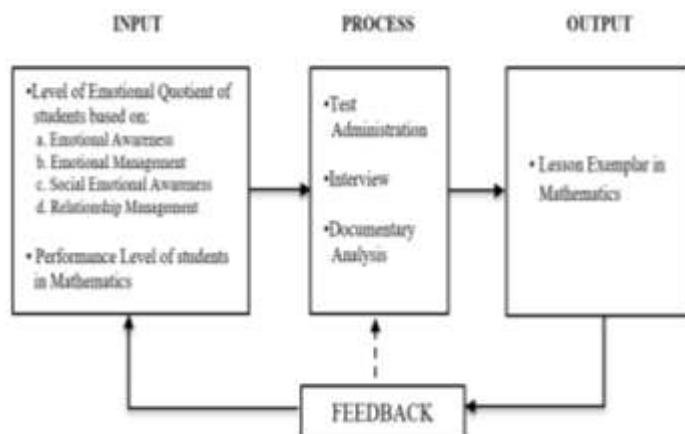


Figure 1: Conceptual Framework

The input of this study consists of the emotional quotient levels of junior high school students across four key domains: Emotional Awareness, Emotional Management, Social-Emotional Awareness, and Relationship Management. These domains represent essential emotional competencies that shape students' ability to navigate academic challenges. Additionally, the study assesses students' mathematics performance levels using the Albay Numeracy Assessment Tools (ALNAT) to determine proficiency levels and identify learning gaps. By correlating students' EQ levels with their mathematics performance, the study seeks to establish whether emotional quotient plays a significant role in academic success.

The process involves a systematic approach to data collection and analysis to determine the extent of the relationship between EQ and mathematics performance. To achieve this, the study employs self-assessment

questionnaires to measure students' EQ levels and unstructured interviews to gain deeper insights into their emotional regulation, social interactions, and learning behaviors. Simultaneously, students' mathematical performance is evaluated using the ALNAT, allowing for classification based on proficiency levels. The relationship between EQ and mathematics achievement is analyzed through correlational analysis, revealing that Relationship Management demonstrates the strongest connection, followed by Social-Emotional Awareness, while Emotional Awareness and Emotional Management exhibit weaker associations. These findings underscore the importance of fostering relationship-building and social-emotional skills in mathematics learning environments. Based on the results, the study develops a targeted intervention plan that integrates EQ strategies into mathematics instruction to address students' least-developed competencies.

The output of this study is a set of mathematics lesson exemplars incorporating EQ-focused strategies. These lesson exemplars are designed to foster emotional quotient while enhancing students' mathematical competence. Specifically, the lessons integrate activities that strengthen Emotional Awareness by encouraging students to recognize and verbalize their emotions related to math challenges. Emotional Management strategies are embedded within instructional activities to help students regulate frustration and maintain concentration during problem-solving tasks. Social-emotional awareness is fostered through collaborative learning techniques, allowing students to recognize and respond to their peers' emotions while engaging in group activities. Relationship Management strategies are also emphasized to promote teamwork, effective communication, and positive peer interactions, all of which contribute to a supportive learning environment.

Each lesson follows a structured approach that includes interactive activities to engage students, followed by collaborative and individual tasks that encourage problem-solving, peer discussion, and application of mathematical concepts. The lessons conclude with a Reflection and Valuing segment, where students analyze their emotional responses and connect their learning experiences to real-life situations. This final segment aims to cultivate emotional resilience, empathy, and confidence, ensuring that students not only develop mathematical proficiency but also enhance their ability to manage emotions in academic settings.

The feedback gathered from the implementation of these lesson exemplars provides valuable insights into the effectiveness of integrating EQ into mathematics instruction. This feedback serves as a basis for refining educational strategies and informs future research on the role of emotional intelligence in academic achievement. By addressing students' cognitive and emotional needs simultaneously, this framework seeks to create a more inclusive, engaging, and emotionally supportive learning environment that enhances

both mathematical performance and overall well-being. Ultimately, the study advocates for the integration of emotional intelligence in educational practices, emphasizing its crucial role in fostering academic success and lifelong learning.

RESEARCH METHODOLOGY

1. Population and Samples

The respondents of this study were junior high school students from Gubat National High School, located in the municipality of Gubat, Sorsogon, Philippines. The sample sizes were calculated using Slovin's formula with a 95% confidence level and a 5% margin of error. A total of 315 students were selected from an initial population of 2,865 junior high school students. Grade 7, which comprised 20% of the population, contributed 70 respondents to the sample. Similarly, Grade 8 (25%), Grade 9 (27%), and Grade 10 (28%) were allocated 88, 95, and 98 respondents, respectively. Stratified random sampling was employed to ensure that the sample was proportionally representative of each grade level, including students from Grade 7 through Grade 10.

2. Research Instrument

The primary instrument used to gather data on the student's emotional quotient (EQ) was the Quick Emotional Intelligence Self-Assessment. This tool, adapted from the 2014 UAA Leadership Conference and based on a model by Paul Mohapel, a neuroscience professor and PhD in psychology, was designed to measure emotional quotient across four domains: Emotional Awareness, Emotional Management, Social Emotional Awareness, and Relationship Management. The assessment consisted of 40 items (10 items for each domain), which the respondents rated on a Likert scale: 0 = never, 1 = rarely, 2 = sometimes, 3 = often, and 4 = always. The students completed the self-assessment to reflect their perceived emotional quotient in these key areas.

For the measurement of students' mathematics performance, the study utilized the Albay Numeracy Assessment Tool (ALNAT). The ALNAT, as outlined in Regional Memorandum No. 133 s. 2022 was developed by the Department of Education-School Division Office of Albay and adapted by DepEd Sorsogon Province, along with other divisions in the Bicol Region. This tool was designed as both an entry and exit assessment for learners in grades 1 to 10 and aimed to provide baseline data on the numeracy skill levels of students in Mathematics. In this study, the ALNAT was specifically used to assess the performance of students in Grades 7 to 10, offering valuable insights into their mathematics proficiency. The ALNAT was particularly relevant as it addressed the gap of having no existing numeracy assessment tools in the Albay and Sorsogon provinces, thus providing crucial data for the study.

In addition to administering the ALNAT and the Quick Emotional Intelligence Self-Assessment, the researcher conducted interviews to gather in-depth insights into the

students' emotions toward Mathematics and how these emotions influenced their academic performance. These interviews were guided by a researcher-designed interview framework, which served as both the interview tool and the guide to ensure consistency in the process.

The interviews were conducted after the quantitative data from the ALNAT and the Quick Emotional Intelligence Self-Assessment had been collected. This sequencing allowed the researcher to tailor the interviews based on the preliminary findings, ensuring a deeper exploration of specific emotional factors influencing students' engagement and performance in Mathematics. The interview framework outlined key topics related to emotional quotient and Mathematics, while maintaining a flexible structure that encouraged open-ended responses. This approach enabled the researcher to gather qualitative data to complement the quantitative results, providing a more comprehensive understanding of the emotional dynamics impacting students' academic experiences.

3. Collection of Data

To initiate the study, the researcher sought formal permission from the relevant authorities. A letter of request was sent to the Division Office of Sorsogon Province to secure approval for conducting the study. Once approved, the researcher sought the consent of the School Principal of Gubat National High School to administer the Quick Emotional Intelligence Self-Assessment (QEISA) and collect the required data. Once permission was granted, the researcher coordinated with the classroom advisers to facilitate the data collection process.

On April 15, 2024, the researcher personally distributed the Quick Emotional Intelligence Self-Assessment (QEISA) tool to the selected respondents in their respective classrooms. Prior to distribution, the researcher explained the purpose of the study, assured respondents of confidentiality, and provided instructions for completing the QEISA. Any questions from the respondents were addressed to ensure clarity and accuracy in their responses.

The results of the Albay Numeracy Assessment Tool (ALNAT), which were used to measure the mathematics performance of the respondents, were obtained directly from the math teachers of the students. The ALNAT scores had been administered and recorded by the school, providing reliable baseline data for the study.

Additionally, to gain deeper insights into the students' emotional responses toward Mathematics and how these emotions influenced their academic performance, the researcher conducted interviews with two randomly selected students from each grade level (Grades 7-10). The interviews were guided by a structured interview guide that focused on the four domains of emotional quotient and their relationship to mathematics performance. These interviews were conducted in a quiet and private space to encourage candid responses, with each session lasting approximately 20

minutes. The conversations were audio-recorded with the consent of the participants for accurate transcription and analysis.

By systematically collecting and organizing the data from the QEISA tool, ALNAT results, and interviews, the researcher ensured a comprehensive dataset aligned with the study's conceptual framework, enabling a thorough analysis of the research objectives.

4. Data Analysis

The study utilized quantitative and qualitative methods to comprehensively examine the relationship between the emotional quotient (EQ) level of junior high school students and their performance in Mathematics.

The level of emotional quotient (EQ) for each domain was assessed by computing the mean scores for each item within the domain and assigning a corresponding frequency description based on the established scale. This process was replicated for every grade level and every domain of emotional quotient, ensuring consistency in scoring and interpretation across all levels and domains. This systematic approach provides a comprehensive view of the EQ levels, highlighting areas of strength and opportunities for growth within the specific domains measured.

The scores were then summed to reflect the overall EQ level, interpreted based on the scale outlined below:

Score Range	Category
0 – 24	Area for Enrichment: Requires attention and development
25 – 34	Effective Functioning: Consider strengthening
35 – 40	Enhanced Skills: Use as leverage to develop weaknesses.

Area for Enrichment indicates that significant attention and development are required. Students falling within this range may struggle with recognizing and managing their emotions or understanding the emotions of others. These individuals are encouraged to focus on strengthening their emotional awareness and regulation skills, as these are foundational elements of emotional intelligence (Goleman, 1995; Mayer & Salovey, 1997).

Effective Functioning suggests that students have a moderate level of emotional quotient. While they may demonstrate some ability to recognize and manage emotions, there is still room for improvement in areas such as emotional control, empathy, and social awareness. These individuals may benefit from further development in these skills to enhance their emotional intelligence and better navigate interpersonal relationships (Bar-On, 2006; Salovey & Mayer, 1990).

Students in the Enhanced Skills are considered to have an enhanced emotional quotient. They exhibit a strong capacity for emotional regulation, empathy, and understanding of both their own emotions and those of others. These individuals consistently demonstrate emotional

awareness and skillful relationship management, and they can leverage their emotional strengths to develop weaker areas, promoting personal growth and improving their ability to connect with others (Goleman, 1998; Mayer et. al., 2004).

For mathematics performance, the students were grouped according to their proficiency levels using the descriptive rating scale provided by the Albay Numeracy Assessment Tool (ALNAT), which classified scores as follows: 90 & above (Transforming), 85–89 (Developing), 80–84 (Emerging), 75–79 (Anchoring), and 74 & below (Needs Major Support).

To examine the relationship between emotional quotient (EQ) and mathematics performance, statistical techniques such as chi-square testing and coefficients of contingency were applied. These tests determined the strength and significance of associations between the students' EQ levels and their proficiency in mathematics. The results were presented in tabular form, displaying the distribution of students across EQ categories and their corresponding mathematics proficiency levels. Graphical representations, such as bar charts and cross-tabulations, were used to highlight patterns and trends in the data.

Additionally, the interviews were used to complement the statistical findings by providing deeper insights into how students' EQ relates to their mathematics performance. While the primary analysis was based on statistical methods, the interview responses helped illustrate and contextualize the numerical data. Key statements were categorized according to relevant EQ domains to highlight recurring themes. Select excerpts were incorporated to capture students' perspectives on their emotions toward mathematics and how these may have influenced their performance. Rather than serving as a separate analysis, the qualitative data supported and reinforced the statistical results, offering a more comprehensive understanding of the relationship between EQ and mathematics achievement.

RESULTS

The data gathered were analyzed and summarized in the tables below. These are intended to illustrate and clarify the findings in line with the study's objectives, offering a clear and organized representation of the results.

1. Level of Emotional Quotient of Junior High School Students

Table 1 shows the emotional quotient of junior high school (JHS) students in four domains-emotional awareness, emotional management, social-emotional awareness, and relationship management. The average score per item, description, total score, and EQ category are also included.

TABLE 1: The Level of Emotional Quotient of Junior High School Students Based on the Four EQ Domains (n = 351)

EQ Domains	Mean	SD	Description
Emotional Awareness	25.91	0.26	Effective Functioning
Emotional Management	27.79	0.79	Effective Functioning
Social Emotional Awareness	28.44	0.81	Effective Functioning
Relationship Management	29.21	0.71	Effective Functioning

Emotional awareness is the ability to recognize and understand one's own emotions, including their effects on thoughts, behaviors, and decision-making (Mohapel, 2015). It is the foundation of emotional intelligence, influencing an individual's ability to regulate emotions and interact effectively with others (Mayer et al., 2008). The data reveal that emotional awareness falls within the category of "*effective functioning*", with an overall emotional quotient of 25.91. They frequently acknowledge the role of emotions in their lives and are often aware of their emotional states. Additionally, respondents can recognize when they are about to feel anger and maintain awareness even when emotionally distressed.

However, difficulties arise in verbalizing emotions, as reflected in the lower mean scores for describing emotions and openly expressing true feelings. Emotional literacy, which refers to the ability to label emotions accurately, is essential for personal well-being and social interactions (Lane et al., 2020). Studies suggest that individuals with high emotional awareness are better equipped to manage stress and exhibit greater psychological resilience (Berrios et al., 2020). Therefore, interventions aimed at improving emotional articulation, such as mindfulness practices and emotional literacy training, may enhance overall emotional quotient.

Emotional Management refers to the ability to regulate one's emotions and to be open to feelings to promote understanding and resilience (Mohapel, 2015). Gross' (1998) emotion regulation theory posits that effective emotional regulation leads to psychological well-being and adaptive functioning. The findings of this study reveal an overall emotional quotient of 27.79 (SD = 0.79), which falls within the category of "*effective functioning*". The highest mean score of 3.14 was recorded for the statement "*I direct my energy into creative work or hobby*," indicating that respondents are more skilled at channeling their emotions into productive outlets, which aligns with Goleman's (1998) emphasis on the importance of emotional regulation for maintaining balance and well-being. The respondents also frequently accept responsibility for their emotional reactions, maintain patience, and demonstrate restraint when feeling

anger. Additionally, respondents exhibit high self-control, as reflected in their ability to resist overindulgence and remain composed in stressful situations.

These results align with recent studies emphasizing the role of emotion regulation in mental health. According to Menefee et al. (2021), individuals who employ adaptive emotion regulation strategies, such as mindfulness, cognitive reappraisal, and behavioral activation, tend to experience improved mental health outcomes, including reduced symptoms of anxiety and depression. Similarly, Pimentel and Pereira (2022) found that employees with higher levels of emotion regulation reported greater job satisfaction, highlighting the broader impact of emotional regulation on both psychological well-being and professional life. Given these findings, emotional regulation training programs, such as cognitive reappraisal techniques and stress-reduction strategies, may further enhance individuals' emotional management skills.

Social Emotional Awareness is the capacity to empathize with others by understanding their experiences and perspectives without losing one's sense of self (Mohapel, 2015). This domain is closely associated with empathy, which facilitates meaningful relationships and prosocial behavior (Goleman, 2006). The findings show that social-emotional awareness falls within the category of "*effective functioning*" among junior high school respondents, with an overall emotional quotient of 28.44 (SD = 0.81). They frequently consider the impact of their decisions on others and demonstrate a strong ability to perceive changes in others' moods. Conversely, the lowest mean score of 1.98 for "*I am able to be supportive when giving bad news to others*" highlights challenges in providing emotional support during sensitive situations, reflecting a need for improvement in this area. This aligns with Goleman's (1998) emphasis on empathy as a critical aspect of emotional intelligence, suggesting that respondents may benefit from developing skills to navigate emotionally challenging conversations effectively.

Empirical research supports the importance of social-emotional awareness in fostering interpersonal relationships. Kotsou et al. (2019) found that individuals with high emotional awareness exhibit stronger social bonds and enhanced communication skills. Additionally, Liu et al. (2021) reported that leaders with high social-emotional awareness tend to be more effective in workplace settings due to their ability to navigate complex social dynamics. While respondents generally perform well in this domain, fostering active listening skills and compassionate communication may further enhance their ability to connect with others on a deeper emotional level.

Relationship Management refers to the ability to inspire, influence, and connect with others, as well as effectively manage conflict. It involves social competence, interpersonal skills, and the capacity to create harmonious

relationships in various situations (Mohapel, 2015). This domain is crucial for personal and professional success, as it determines an individual's ability to navigate social environments (Bar-On, 1997). The findings show the relationship management of junior high school students falls under the category of effective functioning, with an overall emotional quotient of 29.21 (SD = 0.71). Respondents frequently express affection, exhibit sociability, and find it easy to make friends. Furthermore, they are perceived as dependable individuals and often engage in prosocial behaviors, such as helping others.

These findings align with research on emotional quotient, which highlights the role of relationship management in social success. Humphrey et al. (2020) found that individuals with strong relationship management skills are more effective in teamwork and leadership roles. Similarly, Lopes et al. (2006) reported a positive correlation between relationship management and overall job performance. While respondents demonstrate strong interpersonal abilities, further development in conflict resolution and deep emotional sharing may strengthen their relationships further.

Overall, the results suggest that respondents exhibit effective emotional quotient across the four domains: emotional awareness, emotional management, social-emotional awareness, and relationship management. Strengths were observed in recognizing and regulating emotions, as well as in maintaining social connections. However, areas for improvement include enhancing emotional articulation and deep emotional communication.

2. Performance level of students in Mathematics when they are grouped according to their emotional quotient.

Table 2 shows the performance level of junior high school respondents in Mathematics when grouped according to their EQ domains. The EQ levels, number of respondents, mean score, standard deviation, and performance level are given. The level of emotional quotient in the four domains is also included in the table.

TABLE 2: Performance Level of Junior High School Students in Mathematics when Grouped based on their EQ Domains

Emotional Awareness	n	Mean	SD	Performance Level
Enhanced Skills	16	84	5.33	Emerging
Effective Functioning	197	81	5.74	Emerging
Area of Enrichment	138	79	6.08	Anchoring
Emotional Management				
Enhanced Skills	62	81	5.46	Emerging

Effective Functioning	190	80	6.09	Emerging
Area of Enrichment	99	80	6.02	Emerging
Social-Emotional Awareness				
Enhanced Skills	54	82	4.96	Emerging
Effective Functioning	219	80	5.78	Emerging
Area of Enrichment	78	79	6.73	Anchoring
Relationship Management				
Enhanced Skills	72	83	5.02	Emerging
Effective Functioning	186	79	5.78	Anchoring
Area of Enrichment	93	80	6.43	Emerging
OVER-ALL RESULT	351	81	5.79	Emerging

Emotional quotient (EQ) has been widely recognized as an essential factor influencing academic performance, particularly in subjects that require problem-solving skills such as mathematics. According to Goleman (2006), emotional intelligence is categorized into four domains: emotional awareness, emotional management, social-emotional awareness, and relationship management. This study analyzed the mathematical performance of junior high school students when grouped according to their EQ domains.

For emotional awareness, the findings indicate that students with enhanced skills performed at the emerging level, while those with effective functioning also showed an emerging level of performance. Meanwhile, students categorized under the area of enrichment demonstrated an anchoring level of performance. This suggests that higher emotional awareness does not necessarily translate to superior mathematical performance, but it may contribute to self-regulation in learning environments. Research by Pekrun et al. (2017) highlights that students who are aware of their emotions can manage anxiety, leading to improved academic outcomes. However, if students struggle to articulate their emotions, they may face challenges in handling academic pressure effectively.

The findings in emotional management reveal that students with enhanced skills performed at the emerging level, while both the effective functioning group and the area of enrichment group also achieved an emerging level. These results align with previous studies indicating that students who regulate emotions effectively tend to exhibit greater perseverance and academic resilience (Gross, 2015).

However, despite maintaining emotional balance, their mathematical performance remains at the emerging level. This suggests that while emotional regulation aids in managing stress, additional cognitive strategies such as metacognitive awareness and problem-solving techniques may be necessary to enhance mathematical skills (Zimmerman & Schunk, 2020).

Students with enhanced skills in the social-emotional awareness domain performed at the emerging level, while those with effective functioning also remained at the emerging level. Meanwhile, students in the area of enrichment category were at the anchoring level. This suggests that while students who excel in social-emotional awareness may demonstrate strong interpersonal skills, it does not directly correlate with higher mathematical proficiency. Previous studies suggest that social-emotional competence fosters collaboration and classroom engagement, which can indirectly enhance mathematical learning (Jennings & Greenberg, 2019). However, individual problem-solving skills remain crucial for success in mathematics.

In relationship management domains, students with enhanced skills exhibited an emerging level of performance, while those in the effective functioning category were at the anchoring level. In contrast, students requiring enrichment performed at the emerging level. The findings indicate that students who excel in relationship management can establish positive learning environments, which may contribute to overall academic success. According to Lei et al. (2018), students who perceive strong support from their teachers are more likely to develop positive academic emotions and engage more actively in learning, which can enhance their overall academic experience.

The study demonstrates that while emotional intelligence plays a role in shaping students' academic behaviors, its direct influence on mathematical performance is complex. Students with enhanced skills in emotional awareness, emotional management, social-emotional awareness, and relationship management tend to exhibit emerging levels of mathematical proficiency, indicating that EI contributes to resilience and stress management rather than directly impacting problem-solving abilities. Future research may explore interventions that integrate emotional intelligence training with cognitive skill development to enhance overall academic performance in mathematics.

3. Test of Relationship between Students' Emotional Quotient and Performance in Mathematics.

The data in Table 3 revealed varying degrees of relationships between the students' emotional quotient and their performance in Mathematics. Relationship Management demonstrated the strongest connection, with a moderate relationship and a significant chi-square value. This suggests that students with better relationship management skills tend to perform better in Mathematics, possibly due to improved

collaboration and communication in learning environments. Social Emotional Awareness also displayed a significant but low relationship. This indicates that understanding and responding to social-emotional cues can enhance Mathematics performance, particularly in group interactions. However, Emotional Awareness and Emotional Management exhibited very low relationships with Mathematics performance, and these relationships were not statistically significant. While these aspects of EQ influence academic performance to some degree, their direct impact on Mathematics was found to be limited.

TABLE 3: Relationship between EQ and Performance of Students in Mathematics

Statistical Base	Emotional Awareness	Emotional Management	Social-Emotional Awareness	Relationship Management
Degree of Freedom	4	8	8	8
Level of Confidence	0.05	0.05	0.05	0.05
χ^2 tabular	9.488	15.507	15.507	15.507
χ^2 Computed	8.67	12.71	20.92	67.47
Decision on H_0	Accept	Accept	Reject	Reject
Interpretation	Not Significant	Not Significant	Significant	Significant
Contingency Coefficient (C)	0.155	0.187	0.237	0.402
Interpretation of C	Very Low Relationship	Very Low Relationship	Low Relationship	Moderate Relationship

These findings are consistent with the qualitative interview responses that reveal the importance of emotional regulation and social collaboration in math-related tasks. Students who express anxiety and stress when tackling math problems, as indicated by answers such as, *"I feel frustrated and stressed because Math is my weakness among all subjects,"* align with the table's findings of emotional awareness having a very low relationship ($C = 0.155$) with other factors. This suggests that individual emotional struggles may not strongly connect to broader social-emotional dynamics but are critical for individual outcomes. However, students who describe finding motivation and satisfaction from challenges, such as, *"I feel excited, challenged, and happy because I find Math thrilling,"* reflect the positive impact of emotional management in enhancing

performance and resilience, even though its statistical relationship remains very low ($C = 0.187$).

The data revealed varying degrees of relationships between the students' emotional quotient and their performance in Mathematics. Relationship Management demonstrated the strongest connection, with a moderate relationship and a significant chi-square value. This suggests that students with better relationship management skills tend to perform better in Mathematics, possibly due to improved collaboration and communication in learning environments. Social Emotional Awareness also displayed a significant but low relationship. This indicates that understanding and responding to social-emotional cues can enhance Mathematics performance, particularly in group interactions. However, Emotional Awareness and Emotional Management exhibited very low relationships with Mathematics performance, and these relationships were not statistically significant. While these aspects of EQ influence academic performance to some degree, their direct impact on Mathematics was found to be limited.

Estonanto and Dio (2019) emphasize that anxiety and stress are major factors affecting mathematical performance, which is consistent with the qualitative interview responses in this study. Students who express anxiety and stress when tackling math problems, as indicated by answers such as, *"I feel frustrated and stressed because Math is my weakness among all subjects,"* align with the table's findings of emotional awareness having a very low relationship ($C = 0.155$) with other factors. This suggests that individual emotional struggles may not strongly connect to broader social-emotional dynamics but are critical for individual outcomes. However, students who describe finding motivation and satisfaction from challenges, such as *"I feel excited, challenged, and happy because I find Math thrilling,"* reflect the positive impact of emotional management in enhancing performance and resilience, even though its statistical relationship remains very low ($C = 0.187$).

The significant relationship in social-emotional awareness is supported by students' responses on handling group dynamics and disagreements. Statements like *"I listen with full understanding and respectfully correct them if necessary"* and *"We inspire and connect by considering everyone's ideas"* underscore the role of collaboration and respectful communication, which likely contribute to the statistically significant role of social-emotional factors in group settings.

Lastly, relationship management's moderate relationship ($C = 0.402$) resonates with the themes of teamwork and encouragement during collaborative math projects. For example, students noted, *"Working with someone inspires and motivates me. It makes work easier,"* highlighting the role of interpersonal support in alleviating pressure and enhancing problem-solving efficacy. These insights bridge the statistical findings with personal

experiences, emphasizing the value of fostering positive relationships and emotional support in educational contexts.

4. Proposed Lesson Exemplars for the Enhancement of Mathematics Performance of Students: Strengthening Mathematical Abilities through Resilient Thinking and Emotional Quotient (SMART EQ Lesson Exemplar)

The outcome of this study is the development of lesson exemplars in Mathematics for Junior High School (Grades 7 to 10). The students' least learned competencies as identified by the Numeracy Assessment Tool (ALNAT) are addressed in these exemplars, which were created to meet the students' specific needs. Further, the lesson exemplars have the objective of improving the student's emotional quotient (EQ) by integrating strategies that align with the domains of self-awareness, emotional management, social awareness, and relationship management. Teaching Mathematics while considering students' emotional quotient involves creating an inclusive and supportive learning environment that accommodates diverse strengths and needs. Self-esteem and motivation are conditions necessary to inspire learning. The proposed lesson exemplars incorporate interventions to improve students' EQ, ensuring a holistic approach to education. These interventions focus on activities that encourage students to recognize their feelings, strengths, and areas for improvement (self-awareness), teach students how to manage stress and emotions during problem-solving tasks (emotional management), promote empathy and understanding of others' perspectives in collaborative settings (social emotional awareness), and build teamwork, conflict resolution, and effective communication skills (relationship

Mathematics learning has been made easier and more enjoyable through the use of gamified instruction, which includes awards, challenges, and reward cores (Karamert, et. al., 2021). These strategies ensure that students are engaged and actively participating in the lesson, which makes them put in effort. In addition, cooperative learning allows students to work in pairs or groups to foster collaboration while enhancing other social skills. Moreover, the lesson exemplars incorporate diverse activities, including individual, pair, and group tasks, to cater to various learning styles and promote independence, teamwork, and peer interaction.

The lesson exemplars end with a reflection and valuing segment. This part is designed to encourage students to think critically about the learning, emotions, and interpersonal interactions as a product of the lesson, and try to evaluate how such a lesson makes them feel. These are centered on considering some self-reflection questions that guide students to address the challenges of the lesson. Valuing exercises that accompany lessons also bring out how the objectives of the lesson taught relate to actual life scenarios, so that learners are able to appreciate the lesson.

The lesson exemplars are developed for the particular competencies of Grades 7 to 10 and include set and

measurable learning objectives that take into account both academic and emotional growth. These lessons open with an engagement phase in the form of gamified activities that capture their interest, preparing them for collaborative learning. This is followed by exploration and collaboration activities where they use cooperative problem-solving and interact with peers. Their varying learning styles are catered to, allowing students to practice and apply concepts through different activities. The Reflection and Valuing part of the lesson is the last part of the lesson because it enables students to self-assess, reflect on their emotions, and understand the wider context of the topics within the lesson.

By implementing these lesson exemplars, students are expected to improve their mastery of important mathematical competencies, develop emotional quotient in alignment with the four EQ domains, and enhance their ability to work collaboratively and independently. Additionally, students will build critical skills in problem-solving, communication, and peer interaction. These lesson exemplars aim to provide a well-rounded educational experience that not only addresses academic gaps but also fosters emotional and social growth among junior high school students.

DISCUSSIONS

This study utilized the descriptive-correlational method to assess the emotional quotient (EQ) levels of junior high school students across four domains: Emotional Awareness, Emotional Management, Social Emotional Awareness, and Relationship Management, and to determine how these domains relate to their performance in Mathematics. The study also proposes a lesson exemplar based on the findings to address the students' least-learned competencies and enhance their emotional quotient.

The findings of this study reveal that junior high school students generally exhibit effective functioning in the four domains of emotional quotient (EQ): emotional awareness, emotional management, social-emotional awareness, and relationship management. However, variations in their specific competencies within these domains highlight areas for further improvement, particularly in emotional articulation and deep emotional communication. The study further examined the relationship between emotional quotient (EQ) and performance in Mathematics, revealing that while EQ contributes to academic resilience, its direct influence on problem-solving abilities is limited.

The results indicate that emotional awareness is crucial for recognizing and managing emotions, yet students struggle with verbalizing their emotions. This aligns with research by Lane et al. (2020), which emphasizes the importance of emotional literacy in fostering well-being and academic success. Similarly, Trigueros et al. (2020) found that emotional intelligence positively predicts resilience and negatively predicts academic stress and test anxiety among

university students. However, their study did not specifically assess the direct impact of emotional awareness on mathematical performance.

Emotional management, which refers to the ability to regulate emotions and exhibit self-control, also showed an effective level among respondents. The results are consistent with Aldao et al. (2019), who found that individuals using adaptive emotion regulation strategies experience lower levels of anxiety and depression. However, despite effective emotional regulation, students' mathematical performance remained at the emerging level. This suggests that while emotional stability supports persistence and stress management, it must be supplemented with cognitive strategies, such as metacognitive awareness and structured problem-solving approaches, to improve mathematical proficiency (Zimmerman & Schunk, 2020).

Social-emotional awareness, which involves empathy and understanding social dynamics, was another domain where students performed well. The findings align with Ghazy et al. (2019), who observed that higher empathy levels in women correlated with improved mathematics achievement. This suggests that empathy may serve as a protective factor, enhancing attitudes toward mathematics and supporting academic success. Furthermore, Lee (2022) emphasizes the integration of social and emotional learning (SEL) competencies within project-based mathematics classrooms. The study highlights that fostering empathy and social awareness through collaborative problem-solving not only enhances interpersonal skills but also contributes to a more engaging and supportive learning environment. While these social-emotional competencies may not directly boost mathematical aptitude, they play a crucial role in facilitating collaboration and classroom engagement, which are essential for effective learning.

Relationship management exhibited the strongest relationship with mathematics performance. This finding aligns with research by Luo et al. (2024), who found that positive teacher-student relationships significantly predict adolescents' academic achievement, with academic engagement serving as a mediating factor. This suggests that students who establish positive relationships with peers and teachers benefit from collaborative learning experiences, which may enhance their mathematical understanding. Statements from students indicating that working with others inspires motivation and makes learning easier further support this conclusion. This highlights the importance of fostering relationship management skills in academic settings.

The implications of these findings suggest that integrating EQ development into the mathematics curriculum may improve student engagement and resilience. However, emotional quotient alone is insufficient for improving mathematical performance; cognitive strategies and structured instructional interventions must also be incorporated. The lesson exemplars proposed in this study aim to address this by

embedding EQ-focused strategies, such as gamified instruction and cooperative learning, within mathematics lessons. Research by Karamert et al. (2021) supports the effectiveness of gamified instruction in enhancing motivation and engagement, while cooperative learning fosters teamwork and social interaction.

Furthermore, incorporating reflection and valuing exercises at the end of each lesson provides students with an opportunity to assess their emotions and learning progress. This aligns with self-determination theory, which posits that self-reflection and intrinsic motivation play critical roles in academic success (Ryan & Deci, 2017). By integrating emotional and cognitive skill development, these lesson exemplars aim to provide a holistic approach to mathematics education that enhances both academic and socio-emotional competencies.

SUGGESTIONS

Based on the findings of the study, several recommendations are proposed to enhance students' emotional quotient (EQ) and its impact on Mathematics performance. Schools should implement structured programs and targeted activities that focus on strengthening students' emotional quotient across all four domains: emotional awareness, emotional management, social-emotional awareness, and relationship management. These initiatives may include workshops, counseling sessions, and classroom-based exercises designed to help students recognize, regulate, and apply emotional skills effectively in academic settings. By incorporating these activities into the school curriculum, students may develop better coping mechanisms and resilience when faced with mathematical challenges.

Teachers should integrate EQ development strategies into Mathematics instruction. Traditional teaching methods should be supplemented with approaches such as gamified learning, cooperative problem-solving, and guided self-reflection activities. Creating an emotionally supportive classroom environment can help reduce anxiety and foster motivation, ultimately leading to improved academic performance. Encouraging collaborative learning and emphasizing the importance of perseverance in problem-solving can also enhance both cognitive and social-emotional skills.

Furthermore, professional development programs should be provided to educators to equip them with the knowledge and strategies necessary to incorporate emotional intelligence into their teaching practices. Training sessions should focus on recognizing students' emotional needs, fostering positive teacher-student relationships, and implementing interventions that help students manage stress and frustration in Mathematics. By strengthening teachers' competencies in addressing emotional challenges, they can create a more supportive and engaging learning experience for their students.

Specialized support programs should also be developed for students identified as needing improvement in emotional awareness, self-regulation, social-emotional awareness, and relationship management. Schools may implement mentorship programs, peer support groups, and structured learning activities tailored to enhance both emotional and academic competencies. These interventions can provide personalized guidance and emotional support, helping students build confidence and resilience in their mathematical abilities.

Collaboration among teachers, parents, and guidance counselors is essential in ensuring that students receive consistent emotional and academic support. Schools should establish strong communication channels between these stakeholders to align their efforts in reinforcing EQ development. Parents should also be encouraged to promote emotional regulation and positive learning habits at home, creating an environment that nurtures both emotional well-being and academic growth.

Lastly, further research should be conducted to deepen the understanding of the relationship between EQ and Mathematics performance. Future studies may explore the impact of Mathematics achievement on students' emotional well-being, specifically examining how varying performance levels influence emotions such as anxiety, motivation, and self-confidence. Additionally, research should investigate the underlying factors contributing to both high and low Mathematics performance in relation to students' emotional quotient. Identifying these causes can provide valuable insights for designing more effective academic and emotional support programs, ultimately fostering a holistic approach to student development. Educational institutions can create a more emotionally supportive learning environment, enabling students to develop both the academic skills and emotional competencies necessary for success in Mathematics and beyond.

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