

Emotional Intelligence and Mathematical Resilience of Pre-service Teachers

**Shena R. Fabregas, April Rose R. Tamayo,
Kristine Jane E. Villanueva and Jenny Rose S. Aguila***

College of Teacher Education, Batangas State University,
The National Engineering University, Philippines

E-mail: shenaresmfabregas@gmail.com, apiangtamayo15@gmail.com,
villanuevak356@gmail.com and jenaguila20@gmail.com*

*Corresponding author

(Received: 25 Novemmmber 2023, Revised: 31 August 2024, Accepted: 2 September 2024)

<https://doi.org/10.57260/csdj.2025.269186>

Abstract

The study investigated the relationship between emotional intelligence and mathematical resilience in pre-service teachers using descriptive-correlational quantitative research. The researchers used self-report questionnaires to collect data from 88 pre-service teachers at Batangas State University JPLPC-Malvar's College of Teacher Education Major in Mathematics. The questionnaires contained items that assessed EI as well as mathematical resilience. The study's findings indicate a positive relationship between EI and mathematical resilience. Pre-service teachers with higher EI scores were more likely to be resilient in mathematics, implying that higher levels of emotional intelligence can contribute to better performance. Pre-service teachers with higher levels of emotional intelligence were more likely to be resilient in mathematics, implying that higher levels of emotional intelligence can contribute to better outcomes in mathematical learning. Overall, the research emphasizes the significance of emotional intelligence in awareness of mathematical resilience among pre-service teachers. To improve mathematical resilience, pre-service teacher training programs should focus on developing emotional intelligence and promoting a positive attitude towards mathematics, according to the findings.

Keywords: Emotional intelligence, Mathematical resilience, Pre-service teachers

Introduction

Educators and parents alike are continually working to ensure the success of their students. As the world changes, so must our educational institutions. With new technologies, concepts, and legislation, K- 12 education is frequently redesigned. Throughout the early twentieth century, when emotional intelligence emerged as a significant school of thought, learning became a key area of research in psychology.

Learning is now an important concept in many fields of psychology, including cognitive, educational, social, and developmental psychology (Osika et al. , 2022) . Psychologists investigate how learning occurs as well as how social, emotional, cultural, and biological factors impact learning. Emotions influence human cognitive functions such as perception, attention, learning, memory, reasoning, and problem-solving. Emotions may aid in the retrieval of information by enhancing encoding. Emotional experiences are frequent in nature and important, if not vital, in academic settings since emotions impact nearly every aspect of cognition. Tests, exams, assignments, and deadlines are all associated with a variety of emotional states such as displeasure, worry, and boredom. Even disciplines like mathematics have an emotional influence that impacts one's capacity to learn and recall.

Mathematical resilience and learning are significantly influenced by emotions. A multidisciplinary approach examines the relationship between emotions in numerical cognition, mathematics education, learning sciences, and affective sciences, as well as the processing of numerical and physical values, performance in learning algebra, problem-solving, and reasoning, attitudes toward learning technologies, and mathematics achievement (Aro). It also addresses emotive and social topics, including identity and attitudes towards mathematics. Educators may improve the learning experience by working with folks who understand how emotional states connect with learning. In order to foster mathematical resilience, which enables students to continue studying, educators must recognize the emotional intelligence of their students.

Furthermore, emotional intelligence influences a student's approach to mathematics, emotions, and general self- regulation techniques. Emotional intelligence may have a substantial influence on our ability to perform in school, seek a meaningful job that offers us a sense of purpose, and maintain long-term relationships with friends and romantic partners (Cherry, 2022). Students may feel a variety of emotions throughout the course of learning mathematics every day, depending on how that particular day goes. These may include happiness, frustration, pleasure, melancholy, and anxiety. Similar to other human characteristics, emotional intelligence comprises five components: self- awareness, self- regulation, self- motivation, social awareness, and social skills. The five components can be nurtured or inherited, depending on an individual's needs and preferences.

Student progress towards self- regulation is possible upon completion of the first component. Students who are aware of their own feelings are better able to control those feelings and the behaviors that go along with them. This could mean acknowledging challenging feelings and preventing or delaying any impulsive behaviors that could arise. There is more to true emotional awareness than simply being aware of one's own and other people's feelings. Additionally, students have to be ready to use this information in everyday conversations and relationships.

Students with great social skills can create meaningful interactions with others while also learning more about themselves. Emotional intelligence is the capacity to detect and comprehend other people's feelings, desires, intentions, and needs (Sajeta, 2021) . Increasing students' social awareness necessitates their opening their hearts, becoming more sensitive to others, and cultivating a mutually respectful environment. It teaches students to see beyond

outer appearances, build sympathetic connections with those around them, read between the lines, and cultivate an empathetic culture in any environment (Being, 2020). A student with strong emotional intelligence may be better at interacting with people than a student with low EI. EI can assist a child in forming relationships, communicating with others, and maintaining friendships. According to (Bradberry & Demaio, 2019), only approximately 36% of people have this skill. This is due in part to a lack of emotional vocabulary, which prevents people from adequately recognizing how they are feeling. Every unpleasant sensation is simply labeled "bad," and every pleasant feeling is called "good." However, individuals with high EQ can explicitly define their emotions, enabling them to cope with them most effectively.

On the other hand, the fear of mathematics emerges prior to the course of instruction, and if not addressed appropriately, it can severely impact children throughout adulthood. Anxiety produces severe unpleasant feelings and has been shown to have an influence on intellectual, studying, and learning outcomes (Yusof, 2016). Students can safeguard themselves from a number of mental health disorders, including depression and anxiety, by developing mathematical resilience (Santos-Mayo et al., 2022). Although mathematical resilience cannot solve students' issues, it can help them see beyond them, thrive in school, and handle academic stress better. If students are not as resilient as they would like to be, they can grow and acquire techniques to increase their mathematical resilience by focusing on the three emotional domains: Value, Struggle, and Growth.

The first point is that knowing mathematics is beneficial and necessary. Learners who believe in the future advantages of mastering mathematics will be more motivated to pursue mathematics despite the obstacles. The second point to mention is that mastering mathematics requires dedication and hard work. When faced with problems in studying mathematics, learners who have excellent resilience will respond that it requires more time and effort. Thus, students are obligated to pick themselves up and keep trying. The third aspect is self-assurance in one's ability to master arithmetic. Learners' confidence in their capacity to study and understand mathematics must surely foster positive attitudes and uncompromising answers (Rohkmah, 2019).

This study underlines the importance of emotional intelligence in students' mathematical resilience, as it is critical in the process of learning to be prepared to handle problems and learn optimally. The study aims to integrate emotional intelligence into the teaching of mathematics, where several programs have been designed to promote mathematical resilience by delivering the most up-to-date learning styles. However, few programs use Emotional Intelligence as an integral aspect of their mathematical curriculum. The purpose of this study was to establish the important association between pre-service teachers' emotional intelligence and mathematical resilience.

Theoretical Framework

Emotional Intelligence, or EQ as it is more often known, has been hailed as the key to success in life. Emotional intelligence (EI) is defined as a person's capacity to understand and manage their emotions (Cherry, 2022). Daniel Goldman, a Harvard PhD in psychology who co-founded Yale's Child Studies Center's Collaborative for Academic, Social, and Emotional Learning, expanded on Mayer's four branches of emotional intelligence. They are: nonverbally identifying emotions, using emotions to guide cognitive thinking, understanding the information emotions convey and the actions emotions generate, and regulating one's own emotions, which includes emotional self-awareness, self-regulation, social skills, empathy, and motivation (Helen & Babak, 2020).

The ability to sense and grasp emotions, as well as understand how one's own behaviors, moods, and the emotions of others, impact oneself, is referred to as self-awareness. It requires keeping track of emotions, recording different levels of emotional self-awareness, and correctly

recognizing emotions. Adaptability, coping with change, and conflict resolution are all instances of self-regulation. It also refers to defusing difficult or unpleasant situations, being aware of how one's actions affect others, and accepting responsibility for one's actions. This aspect of EI is concerned with the capacity to interact well with others. It requires communicating and engaging with people on a regular basis while being mindful of our own and others' emotions.

Social skills include active listening, vocal communication skills, nonverbal communication skills, leadership, and the ability to build relationships. Empathy is the ability to understand how others feel. This part of EI enables a person to appropriately respond to others depending on their emotions. It assists people in detecting power dynamics that present in all social relationships, but especially in job ones. Understanding power dynamics and how they affect feelings and behavior, as well as correctly identifying situations when power dynamics come into play, is essential for empathy. Motivation refers to intrinsic motivation when seen as a component of EI. Intrinsic motivation arises when a person is motivated by his or her own wants and aspirations rather than external incentives such as money, fame, or recognition. They are more inclined to set goals and take action. Such people are constantly looking for ways to grow and have a strong drive to achieve. They are more likely to be devoted and proactive as well.

Objectives

This study aims to determine pre-service teachers' emotional intelligence and mathematical resilience.

Specifically, the study accomplished the following objectives:

1. Determine pre-service teachers' level of emotional intelligence in the following competencies:

- 1.1 Self-awareness
- 1.2 Self-regulation
- 1.3 Self-motivation
- 1.4 Social Awareness
- 1.5 Social skill

2. Measure respondents' extent of manifestation of mathematical resilience for the following affective dimensions:

- 2.1 Value
- 2.2 Struggle
- 2.3 Growth

3. Correlate pre-service teachers' emotional intelligence and mathematical resilience.

4. Propose a course of action to enhance emotional intelligence and mathematical resilience.

Methodology

Research Design

The researchers used a descriptive- correlational methodology to investigate the strength of the association between pre-service teachers' emotional intelligence and mathematical resilience in support of the study. The goal of descriptive-correlational research is to provide a picture of the current state of affairs. It is also intended to uncover correlations between variables and forecast future occurrences based on current information. At least two variables must be assessed in correlational investigations. The variables are assessed, and then statistical analyses are performed to determine whether there is a link between them.

Respondents

The respondents are Mathematics majors at BSU Malvar Campus College of Teacher Education, with a total of 113 pre-service teachers, 88 of whom were selected using the Raosoft Calculator. Gender was not a barrier to participation. In this research project, either male or female respondents are possible. In order to provide a valid and trustworthy results, a sufficient number of respondents and an adequate sampling procedure were used. Batangas State University JPLPC-Malvar has 113 pre-service mathematics instructors. The sample size of respondents was computed using the Raosoft Digital Calculator with a margin of error of 5%, yielding a total of 88 respondents. The respondents were chosen using simple random sampling to achieve a proportional distribution of the sample size. For proper representation, the responses were divided into yearly groups.

Data Gathering Tool

The researchers utilized a researcher- made questionnaire as the data- gathering instrument. The questionnaire was split into two sections. The first section focused on the levels of emotional intelligence in relation to its five major parts with 5 item indicators each, while the second section examined the levels of mathematical resilience in relation to its three affective dimensions with 5 item statements each. This is given to pre-service teachers enrolled in the Bachelor of Secondary Education with a Major in Mathematics at the College of Teacher Education.

Cronbach alpha coefficient was computed to assess the internal consistency of the item statements regarding pre-service teachers' emotional intelligence, including its five learning competencies, and their extent of manifestation of mathematical resilience, including its three affective dimensions. The computed values of 0.972 for respondents' level of emotional intelligence and 0.972 for the extent of manifestation of mathematical resilience are greater than 0.70 affirming the questionnaire has an excellent reliability level.

The following scale range and corresponding verbal interpretation were applied:

Numerical Value	Mean Ranges	Interpretation
4	3.51 - 4.00	Very Good/ Highly Manifested
3	2.51 - 3.50	Good/ Manifested
2	1.51 - 2.50	Fair/ Slightly Manifested
1	1.00 - 1.50	Needs Improvement/ Least Manifested

Data Collection Procedure and Treatment

The researchers obtained permission to conduct the study from the College Dean of CTE at Batangas State University- The National Engineering JPLPC Malvar Campus. After obtaining permission, they distributed a questionnaire to the intended respondents.

Before enrolling participants in the study, the researchers obtained their voluntary and informed consent. Respondents were fully informed of the research's goals, procedures, potential risks and benefits, and their opportunity to withdraw at any time without penalty.

The questionnaire was assessed, and the findings were collated, totaled, and interpreted as the basis for answering each question. The researchers collected data by polling students and administering questionnaires to them. The respondents' privacy was respected by the researchers. The data was collected and maintained in a manner that preserves the confidentiality of the information provided by participants.

The researchers gave the questionnaires directly to the selected participants after determining how to collect data, developing relevant study questions, and making necessary changes. The questionnaires were completed and returned successfully. The researchers carried out their task with honesty and integrity. They presented their results honestly and did not fabricate or manipulate any data. The data was collated, counted, and statistically treated when the surveys were securely returned.

Results

The collected data were analyzed to create and demonstrate the tables below. These are intended to point out and clarify the findings in accordance with the study's objectives. They provide the findings in an organized and easily comprehensible manner.

1. The level of emotional intelligence of pre-service Teachers

1.1 Self-awareness

Table 1 Level of Emotional Intelligence in terms of Self-awareness

Item Statements	M	SD	VI
1. I am aware of how my emotions influence my performance in Mathematics.	3.39	0.67	Good
2. In order to learn Mathematics, I am guided by my beliefs and ambitions.	3.25	0.65	Good
3. I am aware of my mathematical talents and weaknesses.	3.58	0.60	Very Good
4. I am introspective and attempt to learn by repeating the same actions again.	3.40	0.67	Good
5. I am open to honest comments, fresh viewpoints, lifelong learning, and self-improvement.	3.61	0.51	Very Good
Overall	3.45	0.62	Good

Table 1 shows the pre-service teachers' level of emotional intelligence in terms of self-awareness. This indicates that the respondents are receptive to candid feedback, new perspectives, continuous learning, and self-awareness indicators. It is their technique for understanding their own strengths and limitations. This suggests that respondents have a high level of self-awareness but lack sufficient direction in terms of understanding their values and goals in mathematics education.

It denotes that pre-service teachers have a high level of self-awareness, with students who possess this competency having strong emotional awareness, accurate self-evaluation, and self-confidence. According to Daniel Goleman, an author, psychologist, and scientific writer,

a student who lacks emotional skills, self-awareness, and the ability to control their own painful emotions cannot have empathy or productive connections. As a result, no matter how bright the student is, they will not get very far. Some students are said to be intellectually clever but socially and interpersonally unskilled. Success does not automatically accompany individuals with a high IQ.

1.2 Self-regulation

Table 2 Level of Emotional Intelligence in terms of Self-regulation

Item Statements	M	SD	VI
1. I think clearly and stay focused under pressure, even when the calculations are complicated	3.00	0.00	Good
2. I admit my own mistakes and mathematical errors	3.60	0.56	Very Good
3. I work on my mathematical activities with organization and meticulousness	3.15	0.69	Good
4. I handle many demands, shifting priorities, and abrupt adjustments with ease	2.95	0.68	Good
5. I entertain original solutions to problems	3.38	0.59	Good
Overall	3.22	0.50	Good

Table 2 shows emotional intelligence in terms of self-regulation. The respondents demonstrate strong emotional intelligence in the subject of mathematics instruction. This indicates that the respondents admit to making mistakes and arithmetic blunders.

This demonstrates that pre-service teachers have high self-regulation skills consistent with emotional intelligence. Self-regulation, according to Cuncic (2022), allows us to be more resilient and recover from failures while keeping calm under pressure. Self-regulation talents have been related to a number of positive health outcomes, as per researchers. These include increased stress tolerance, happiness, and overall well-being.

1.3 Self-motivation

Table 3 Level of Emotional Intelligence in terms of Self-motivation

Item Statements	M	SD	VI
1. I set challenging targets and take smart risks	3.19	0.79	Good
2. I am always learning to improve my mathematical performance	3.56	0.60	Very Good
3. I consider higher goals to discover my purpose	3.42	0.60	Good
4. I set greater ambitions for myself than what are necessary or expected of me	3.41	0.64	Good
5. I operate with the hope of success rather than fearing mathematics	3.39	0.63	Good
Overall	3.39	0.65	Good

Table 3 depicts emotional intelligence in terms of self-motivation. The respondents demonstrate strong emotional intelligence in the discipline of mathematics. This indicates that the respondents are always learning to enhance their mathematical proficiency.

Pre-service teachers may have a high level of self-motivation as a part of their emotional intelligence. According to Marsono et al. (2019), students have a natural motivation to attain high results when learning mathematics. This suggests that pre-service teachers are aiming for

greatness, which is consistent with their dedication to pursuing goals despite challenges and disappointments.

1.4 Social Awareness

Table 4 Level of Emotional Intelligence in terms of Social Awareness

Item Statements	M	SD	VI
1. I assist others in understanding their needs and opinions	3.34	0.62	Good
2. I gladly offer appropriate assistance to my classmates who struggle with mathematics	3.36	0.68	Good
3. I mentor, provide timely coaching, and assign projects that test and improve a person's mathematical skills	3.17	0.70	Good
4. I provide an atmosphere in which diverse individuals may thrive	3.16	0.70	Good
5. I read situations, organizational, and external realities involving Mathematics	3.18	0.73	Good
Overall	3.24	0.70	Good

Table 4 depicts emotional intelligence in the sphere of social awareness. The respondents demonstrate strong emotional intelligence in the subject of mathematics instruction. This indicates that the respondents are willing to assist their classmates who are struggling in Mathematics.

According to the Common Core State Standards for Mathematical Practice (The University of Texas Dana Center, 2020), students should solve real-world and mathematical problems by working effectively with peers, creating, communicating, and assessing ideas, and persevering despite challenges. This suggests that pre-service teachers should have empathy for other pupils' needs. They expand their horizons by engaging with other students and are able to comprehend their peers' emotional currents and relationships.

1.5 Social Skills

Table 5 Level of Emotional Intelligence in terms of Social Skills

Item Statements	M	SD	VI
1. I listen carefully, seek mutual understanding, and am warmly welcomed the sharing information about mathematics with my classmates	3.47	0.64	Good
2. I realize the importance of change and the removal of mathematical obstacles	3.31	0.68	Good
3. I search out mutually beneficial connections	3.32	0.67	Good
4. I promote a friendly, cooperative climate inside the classroom	3.45	0.62	Good
5. I model cooperative traits such as respect, helpfulness, and collaboration in our mathematics class	3.39	0.65	Good
Overall	3.39	0.65	Good

Table 5 shows the emotional intelligence level in terms of social skills. The respondents demonstrate strong emotional intelligence in the subject of mathematics instruction. This indicates that they listen well, seek mutual understanding, and are eager to share their mathematical knowledge with their peers.

Respondents recognized the need for change and for mathematical impediments to be removed from their learning process. According to Frederickson & Cline (2002), who emphasized the interconnected nature of the subject, students who struggle with mathematics may appear to feel more confused and disempowered than those who struggle with other disciplines.

2. Extent of Manifestation of Mathematical Resilience of Pre-service teachers

2.1 Value

Table 6 Extent of Manifestation of Mathematical Resilience in terms of Value

Item Statements	M	SD	VI
<i>As a pre-service teacher, I...</i>			
1. Foster positive values and attitudes towards learning mathematics	3.76	0.43	Highly Manifested
2. Develop logical and critical thinking skills	3.59	0.49	Highly Manifested
3. Increase analytical thinking in solving math problems	3.58	0.54	Highly Manifested
4. See that there is no profession in the world that doesn't use mathematics	3.59	0.72	Highly Manifested
5. Appreciate the beauty of mathematical figures in the real world	3.77	0.42	Highly Manifested
Overall	3.66	0.52	Highly Manifested

Table 6 shows the extent to which mathematical resilience manifests itself in terms of value. The respondents demonstrated a high level of mathematical resilience in the field of learning and teaching. This demonstrates that respondents value the beauty of mathematical figures in the real world.

Mathematically resilient students think that mathematics is an essential topic that should be studied. Analytical reasoning is necessary for improving mathematical skills, and vice versa. Other math concepts, such as performing computations and comprehending formulae and definitions, cannot be taught until analytical thinking is present. Simultaneously, mathematics as a field has the potential to dramatically develop analytical skills. Rather than learning formulae by repetition and rote memory, this method allows pupils to comprehend and trace the phases that underpin a concept (Kuma et al., 2022).

2.2 Struggle

Table 7 Extent of Manifestation of Mathematical Resilience in terms of Struggle

Item Statements	M	SD	VI
<i>As a pre-service teacher, I...</i>			
1. Improve mathematical abilities by focusing more on any weak points	3.66	0.50	Highly Manifested
2. Memorize formulas to solve math problems	3.45	0.59	Moderately Manifested
3. Correct computational errors and comprehend specific mathematical relationships	3.50	0.61	Moderately Manifested
4. Apply the steps to solve math problems	3.68	0.49	Highly Manifested
5. Sense the problem at hand and persevere to solve it by employing logic	3.49	0.55	Moderately Manifested
Overall	3.56	0.55	Highly Manifested

Table 7 shows the extent to which mathematical resilience manifests itself in terms of difficulties. The respondents demonstrated a high level of mathematical resilience in terms of learning and teaching processes. This means that when solving arithmetic problems, students should take steps.

This suggests that pre-service teachers have a high level of mathematical resilience in the face of hardship. Mathematically resilient students recognize that patience is essential to making progress in mathematical studies. They recognize that when studying mathematics, everyone faces hurdles and problems, and that errors are a natural part of the process, and that one must persevere and learn not to succumb to the bad feelings that come with learning anything new (Mitchell et al., 2019).

2.3 Growth

Table 8 Extent of Manifestation of Mathematical Resilience in terms of Growth

Item Statements	M	SD	VI
<i>As a pre-service teacher, I...</i>			
1. Face math challenges and learn different patterns of coping	3.44	0.58	Moderately Manifested
2. Support one's feelings of risk, potential failure, and making mistakes	3.55	0.59	Highly Manifested
3. Enthusiastically show off skills in math class	3.28	0.59	Moderately Manifested
4. Learn mathematics in an effective way to reach my potential	3.63	0.53	Highly Manifested
5. Show a growth mindset to excel in math	3.58	0.54	Highly Manifested
Overall	3.50	0.57	Moderately Manifested

Table 8 shows the extent to which mathematical resilience manifests itself in terms of development. The respondents demonstrate a high level of mathematical resilience within the scope of the educational process. This indicates that the learners are efficiently studying mathematics in an efficient manner in order to achieve their full potential.

This demonstrates that pre-service teachers made moderate progress in Mathematical Resilience. Resilient learners approach learning with a growth mindset. They are comfortable with challenges and the possibility of encountering mathematical difficulties. Resilient learners recognize when they are stuck and have the language to seek assistance when needed. Most importantly, they believe they have the ability to "do math" (Davidson, 2022).

3. Relationship between the respondents' Level of Emotional Intelligence and Extent of Manifestation of Mathematical Resilience

Table 9 reveals that respondents' emotional intelligence is connected to their mathematical resilience, with a calculated Pearson r value of 0.857, which is significant at the p<0.05 level. This means that the null hypothesis was rejected, demonstrating that there is a strong correlation between respondents' emotional intelligence and mathematical resilience.

Table 9 Relationship between the respondents' Level of Emotional Intelligence and Extent of Manifestation of Mathematical Resilience

Variables	Computed Pearson r	p value	Decision H_0	Interpretation
Emotional Intelligence and Mathematical Resilience	0.857	0.000	Reject	Significant
$\alpha = 0.05$				

According to the research "Emotional Intelligence Through Mathematical Resilience in Secondary Students Based on Gender" (Faradillah & Wulandari, 2021) , the low mathematical resilience in kids, one of the causes is the fear of being wrong, therefore it demonstrates things connected to their emotions. Mathematical resilience and emotional intelligence are intertwined, and students must cultivate both. The emotional intelligence required to overcome obstacles and learn best.

4. Proposed course of action to enhance emotional intelligence and mathematical resilience

Following the disclosure of the emotional intelligence and mathematical resilience of the researchers proposed a strategy for developing pre-service teachers' emotional intelligence and mathematical resilience. The suggested action plan is presented in a tabular style, including objectives, activities, the persons involved, a time frame, and outcomes.

Table 10 Proposed Course of Action to Enhance Emotional Intelligence and Mathematical Resilience

Objectives	Activities	Persons Involved	Time Frame	Outcomes
1. To understand emotional competence and enhance mathematical confidence.	Conducting emotional intelligence and mathematical resilience assessments.	Professors Students	1 hour	Students higher academic performance/ achievement
2. To enhance the coping and problem-solving skills of students.	Providing training on emotional intelligence and resilience.	Professor, Area Director, Coordinator	1 week	Stress reduction, Enhanced critical thinking, and increased adaptability.
3. To strengthen relationships and promote collaboration among students	Facilitating team-building activities.	Professor Students University Administrators	3 days	Improved communication, leadership skills, and leadership skills of students.
4. To facilitate knowledge sharing and increase productivity	Encouraging communication and collaboration.	Professor Students University Administrators, Parents/ Guardian	1 day	Improved communication, collaboration, empathy, and confidence.
5. To promote resilience and persistence.	Fostering a growth mindset.	Professor Students Parents/ Guardian	1 day	Improved resilience, self-efficacy, academic achievement, and attitude towards learning.
6. To determine if the activities have met their intended goals and outcomes.	Evaluating the effectiveness of	Mathematics Professors, Students Parents/ guardians, student	1 month	Student engagement, goal attainment, and sustainability.

Discussions

The study's participants revealed a high degree of emotional intelligence across several domains, including self-awareness, self-regulation, self-motivation, social awareness, and social skills. Their mathematical resilience was shown to be high, particularly in terms of valuing and coping with problems. However, the degree of expression in terms of mathematical resilience was moderate. When emotional intelligence was connected with mathematical resilience, all p-values were less than 0.05, indicating that the null hypothesis was rejected and a substantial association between emotional intelligence and mathematical resilience was confirmed. The researchers suggested course of action includes activities involving team-building, communication and cooperation encouragement, promoting a growth mindset, and evaluating effectiveness. These courses of action are expected to help students manage their emotions more successfully and actively engage in interpersonal interactions, thereby fostering mathematical resilience.

Conclusion and suggestions

The respondents exhibit a commendable level of emotional intelligence, encompassing self-awareness, self-regulation, self-motivation, social awareness, and social skills. They also demonstrate a high manifestation of mathematical resilience in terms of valuing challenges and coping with struggles, while the growth dimension is moderately manifested. Notably, there is a significant relationship between the respondents' emotional intelligence and their mathematical resilience.

In light of the noteworthy findings from the study, the researchers suggest specific enhancements for teacher preparation programs. Firstly, they recommend incorporating emotional intelligence seamlessly throughout the teacher preparation curriculum, encompassing coursework, field experiences, and internship programs. This entails motivating pre-service teachers to contemplate their emotions and observe seasoned educators who demonstrate elevated emotional intelligence. Secondly, the researchers propose integrating mathematical resilience into teacher preparation programs, embedding it within various components such as coursework and field experiences. Pre-service teachers should be encouraged to employ inquiry-based methods in teaching mathematics, addressing practical mathematical challenges to underscore the real-world relevance of mathematical concepts. Finally, the researchers advise future studies to acknowledge the context-dependent nature of results concerning emotional intelligence and mathematical resilience. It is crucial to consider the specific characteristics of the studied population, the assessment tools employed, and the cultural, educational, or environmental context when interpreting these findings.

New knowledge and the effects on society and communities

Understanding that pre-service mathematics teachers possess a high level of emotional intelligence implies that they are likely adept at recognizing and managing their own emotions, as well as understanding and navigating the emotions of others. This has the potential to improve their teaching efficacy and interactions with pupils. Furthermore, the discovery of highly exhibited mathematical resilience among pre-service math instructors shows that they have can value challenges, cope with obstacles, and maintain a growth-oriented mentality in the face of mathematical difficulties. This conclusion is crucial for the area of education because it shows that these instructors are well-prepared to deal with the inherent problems of

teaching mathematics and may act as good role models for their pupils in terms of overcoming mathematical barriers.

In practice, this understanding might guide efforts to improve emotional intelligence and capitalize on the existing high level of mathematical resilience among pre-service math teachers through teacher training programs and professional development activities. It also emphasizes the possibility for these educators to have a beneficial influence on students' emotional well-being and attitudes toward mathematics in their future teaching responsibilities.

Pre-service mathematics teachers' high levels of emotional intelligence and mathematical resilience can have far-reaching and positive consequences on society and communities. In classrooms, teachers with strong emotional intelligence create environments that are supportive, empathetic, and conducive to effective communication, contributing to improved teaching and learning outcomes. As role models, these educators inspire students with their growth-oriented mindset and perseverance in the face of mathematical challenges, fostering a culture of resilience and confidence in learning. Beyond the classroom, teachers' ability to engage with parents, colleagues, and community members, facilitated by their emotional intelligence, contributes to building strong community networks. Reduced math anxiety in students is another notable impact, creating a positive learning atmosphere. The cultivation of mathematical resilience not only prepares students for academic success but equips them with essential life skills, contributing to the overall well-being and development of individuals within the community. Furthermore, as students influenced by emotionally intelligent and resilient teachers pursue higher education and careers, the community benefits from a more skilled and knowledgeable workforce. In essence, pre-service mathematics teachers with these qualities play a crucial role in shaping positive, empowered, and resilient communities.

References

Bradberry, L., & Demaio, J. (2019). Learning by Doing: The Long-Term Impact of Experiential Learning Programs on Student Success. *Journal of Political Science Education*, 15(1), 94-111. Retrieved from <https://eric.ed.gov/?id=EJ1209931>

Cherry, K. (2022). *Emotional intelligence skills: 5 components of EQ*. Verywell Mind. Retrieved from <https://www.verywellmind.com/components-of-emotional-intelligence-2795438>

Cuncic, A. (2022). *How to Develop and Practice Self-Regulation?*. Retrieved from <https://www.verywellmind.com/how-you-can-practice-self-regulation-4163536>

Davidson, C. (2022). *Building Resilience in Young Math Students*. Retrieved from <https://www.edutopia.org/article/building-resilience-young-math-students>

Frederickson, N., & Cline, T. (2002). *Special educational needs inclusion and diversity: a textbook*. Open University Press. Philadaphia.

Faradillah, A., & Wulandari, S. (2021). Emotional intelligence through mathematical resilience on secondary students based on gender. *Jurnal Pendidikan dan Pengajaran*, 54(2), 273-285. Retrieved from <https://ejournal.undiksha.ac.id/index.php/JPP/article/view/33958>

Helen, C., & Babak, D. (2020). *Social and Emotional Learning and Resilience Education*. Retrieved from https://link.springer.com/chapter/10.1007/978-981-15-3959-6_11

Kumar, P., Singh, S. P., & Chandra, U. (2022). A Study on Meta-Cognitive Skills of Senior Secondary Students in Relation to their Problem-Solving Awareness. *Specialusis Ugdymas*, 1(43), 2637-2650. Retrieved from <http://sumc.lt/index.php/se/article/view/304>

Marsono, M. B., Ashari, Z. B., Jumaat, F. B., Samah, N. B. A., Abdullah, A. H. B., & Ali, D. F. (2019). *The Relationship Between Self-Determination Emotional Intelligence Towards Achievement Motivation in Mathematics*. Retrieved from <https://ieeexplore.ieee.org/document/9226006>

Mitchell, J., Nyamapfene, A., Roach, K., & Tilley, E. (2019). Philosophies and pedagogies that shape an integrated engineering programme, *Higher Education Pedagogies*, 4(1), 180-196. Retrieved from <https://doi.org/10.1080/23752696.2018.1507624>

Osika, A., MacMahon, S., Lodge, J.M., and Carroll, A..(2022). *A framework for learning in seven principles*. Retrieved from <https://www.timeshighereducation.com/campus/collections/framework-learning-seven-principles>

Rokhmah, K. (2019). *Mathematical Resilience: Is That Affecting The Students' Mathematics Achievement?*. Retrieved from <https://iopscience.iop.org/article/10.1088/1742-6596/1320/1/012036/pdf>

Sajjeta, U. (2021). *5 Elements of Emotional Intelligence*. Retrieved from <https://medium.com/change-your-mind/5-elements-of-emotional-intelligence-551c87e041dd>

Santos-mayo, A., De, E., & Moratti, S. (2022). Conditioned up and down modulations of short latency gamma band oscillations in visual cortex during fear learning in humans. *Scientific Reports*, 12(1), 2652. Retrieved from <https://doi.org/10.1038/s41598-022-06596-8>

The University of Texas Dana Center. (2020). *Social and Emotional Learning and Mathematics Inside Mathematics*. Retrieved from <https://www.insidemathematics.org/common-core-resources/mathematical-practice-standards/social-and-emotional-mathematics-learning>