The Mediating Effect of Emotional Intelligence on the Relationship between Teaching Practices and Problems and Difficulties towards Learning Mathematics

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ABSTRACT

This study aims to establish the mediating effect of emotional intelligence on the relationship between teaching practices and problems and difficulties encountered by senior high school students in learning mathematics. A descriptive–correlational design is employed in this study and targeted a total of three hundred (300) respondents using a random stratified sampling to guarantee that biases will be avoided. Questionnaires are administered online using Google Forms for easy data collection. The study's results indicated that SHS respondents perceived the level of teaching practices, with a weighted mean of 4.15. Additionally, the level of problems and difficulties encountered in learning mathematics among SHS students was found to have a weighted mean of 3.87. In contrast, the level of emotional intelligence was calculated to be 4.16. All of these levels are considered to be high. Therefore, there is a significant relationship between teaching practices and problems and difficulties encountered by the SHS respondents in learning mathematics. The relationship between teaching practices and the problems encountered by SHS students in selected schools in Davao del Norte regarding learning mathematics is directly mediated by emotional intelligence, as indicated by the mediation analysis. This suggests that effectively managing the students' emotional intelligence can directly affect their performance and accomplishments in mathematics. Furthermore, the study indicates that educators' teaching practices can directly affect how students handle the problems and difficulties they face.

Keywords: teaching practices, emotional intelligence, emotional problems, problems and difficulties in mathematics, student attitude, teaching strategies, senior high school students

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

INTRODUCTION

Mathematics is commonly accepted as difficult and of little interest to many people (Ukobizaba, Ndihokubwayo, Mukuka, and Uwamahoro, 2021). In today's global educational context, considerable research has examined the root causes of students' common difficulties in learning and mastering mathematics competencies. This is viewed as a struggle among students with problems and difficulties in mathematics. As a result, students demonstrate slow or inaccurate recall of basic arithmetic facts, lack comprehension, or fail to retain prior learning, making it difficult for them to represent mathematical concepts mentally.

It is essential to identify the possible causes of the problems and difficulties students encounter. Considering mathematical standards, student performance in mathematics declines, as do the new requirements and mandates related to increased accuracy and accountability for all students' results. Students will be able to engage in the possibilities of solving complex long-term problems, proposing and evaluating mathematical theories, and drawing conclusions. In addition, students can read, write, and analyze mathematics, use proofs, sketches, and objects from the natural world, and engage in formal mathematical and logical arguments (Isran, Susanta, Rahimah, and Syafri, 2025). The ability to solve word problems, compute, and apply ideas and skills in mathematics to multiple decisions in our lives. Szabo, Körtesi, Guncaga, Szabo, and Neag (2020) stated that in our technology-rich society, mathematics is particularly evident, with the relevance and requirement of advanced qualifications increasing, as well as the need for problem-solving skills.

Teachers' teaching practices also play a vital role in developing students' skills in learning mathematics. Different concrete opportunities must be provided to facilitate realistic learning and develop students' mathematical skills. Imposing relevant, challenging questions, problem-solving that deepens reasoning skills, and even making connections to real–life situations are vital tools for educators to bring out learners' capabilities. Teachers had to be equipped with various teaching strategies and practices addressing students' issues and learning difficulties (Vos, 2018). Considering the trend nowadays that teachers are not just merely information givers but facilitators of the learning process. Connectivism is also considered a 21st-century teaching and learning theory.

Many studies that have been published concerning problems and difficulties towards learning mathematics, such as barriers and difficulties of students in the mathematics learning process in Junior High School by Manalu & Judijanto (2024), relationship between emotional intelligence and mathematical skills in high school students by Rodriguez & Vazquez (2020), as well as the role of emotional intelligence in effective teaching and classroom management by Todmal, Rao & Gagare (2023). However, there is insufficient emphasis on the mediating role of emotional intelligence in the relationship between teaching practices and problems and difficulties in learning mathematics. In this context, the researcher aims to determine whether emotional intelligence actually affects the relationship between the two variables, as this may impact the intended beneficiaries of this study. All of these findings indicate a need to create an action plan, and other intervention programs can then be developed to enhance teaching practices, further improve instruction delivery, and simultaneously mitigate the negative factors of learning. Furthermore, the results of this study could serve as a point of reference for other educational institutions to enhance teachers' teaching practices and address learning problems and difficulties.

The basis of this research is the theory of connectivism. Connectivism is a theory of teaching and learning commonly used in the 21st century. Passarelli and Kolb (2023) discovered that teachers' and students' experiences and actions can be shaped through the connections formed within group knowledge. This group knowledge is achieved through interactions within the network. In Moran's (2016) theory of practice, a personal theory of teaching practice is a teacher's union of theory and practice, a way of conceptualizing and enacting teaching that considers the difficulties students encounter, especially in grasping new learning. Alzahrani, Alharbi, and Alodwani (2019) found that teachers who are socially and emotionally competent develop supportive relationships with students; they create activities that build on the strengths of the students in terms of difficulties and problems encountered, and help students develop the basic social and emotional skills necessary to participate in the class. This proposition aligns with the study by Zuo and Saleemad (2024), emphasizing the importance of educators employing a judicious blend of constructivist and explicit teaching, accompanied by ample guided practice/scaffolding to foster independence.

The independent variable represents the teaching practices, which include a variety of indicators, such as cooperative learning, student-centered group activities, and collaboration; classroom discussions, which involve the interactive exchange of ideas; and self-assessment and self-reflection are personal assessments

and evaluations; Assessment balanced instruction is an integrated teaching approach; academic press and expectations represent high academic standards and expectations; and competence building involves skill development and mastery (Yoder, 2014).

The dependent variable points to the problems and difficulties in learning mathematics, with indicators on personal problems are the individual challenges; emotional problems are the emotional challenges; problems with teachers' instruction are the instructional challenges; problems with school adjustment are the difficulties in adapting to school; problems in adjusting to classmates are the challenges in peers integration; and problems arising from extracurricular activities involvement are the issues or challenges related to extracurricular participation (Guiab & Ganal, 2014).

Lastly, the mediating variable points to the effect of emotional intelligence with following indicators; self-awareness is the conscious understanding of the self; self-regulation is the control of one's behavior and emotions; emotional self-control is managing one's emotions effectively; flexibility is adaptability to change; motivation is the inner drive to achieve goals; achievement is the successful attainment of goals', and well-being and stress management is the maintaining of health and coping with stress (Stellar).

This study encompasses comparable literature and studies that focus on factors and associations of the independent, dependent, and mediating variables. The study by Kamour & Altakhayneh (2021) found that the experimental group experienced a significant reduction in math anxiety, with no difference in anxiety levels between male and female students. Based on these results, the researchers recommend implementing counseling programs grounded in social-emotional learning to address math anxiety, highlighting the importance of supportive teaching practices in overcoming challenges in learning mathematics. However, the study by Farhan & Alfin (2019) found that emotional intelligence does not significantly affect students' mathematics achievement or learning practices. This suggests that these factors may not be the primary influences on math performance, highlighting the need for teaching practices to consider other elements that more directly affect student achievement in mathematics.

Mulyani & Lubis' (2024) research found that emotional intelligence significantly influences students' mathematics learning outcomes. Students with moderate levels of emotional intelligence demonstrated notable achievements in mathematics, indicating that emotional factors play a crucial role in overcoming mathematical challenges and achieving academic success. The study also highlights the combined effect of intellectual and emotional intelligence on math performance, suggesting that cognitive and emotional skills contribute to student achievement. Additionally, Muhtadi, Kaliky, Hukom, and Samal's (2022) study found a strong positive correlation between emotional intelligence and students' mathematical achievement, indicating that higher emotional intelligence is associated with better math performance. These findings underscore the pivotal role of emotional intelligence in overcoming challenges in mathematics, providing a solid theoretical foundation for enhancing students' future math achievement.

The results of Mazana, Suero Montero, and Olifage's (2019) study indicate that while students initially have a positive attitude toward mathematics, this attitude tends to decline as they progress to higher education levels. A weak but significant positive relationship exists between students' attitude and math performance, with enjoyment and attitude being important predictors of success. Challenges in learning math are linked to teaching methods, limited institutional resources, ineffective learning and exam strategies, and difficulties understanding instructions. These findings underscore the importance of enhancing teaching practices and creating supportive learning environments to promote a greater enjoyment of mathematics and improve student performance. Furthermore, Hamukwaya & Haser's (2021) findings suggest that teacher education programs must enhance preservice teachers' understanding of how their knowledge, beliefs, and teaching practices related to math learning difficulties (MLD) impact student learning. Teachers' beliefs about math and what constitutes high performance may influence how they

address challenges in math education, highlighting the importance of preparing teachers to support students struggling with mathematics effectively.

This study aims to determine the mediating role of emotional intelligence in the relationship between teaching practices and the problems and difficulties students encounter in learning mathematics. First, assess the level of implementation of teaching practices that focus on positive instructional interactions, including Cooperative Learning/Group Learning, Classroom Discussions, Self-Assessment and Self-Reflection, Balanced Instruction, Academic Press and Expectation, Competence Building – Modeling, Practicing, Feedback, and Coaching. Second, assess the level of problems and difficulties students face in learning mathematics competency, categorized into Personal Problems, Emotional Problems, Problems with Teacher's Instruction, Problems with School Adjustment, Problems in Adjusting to Classmates, and Problems Arising from Involvement in Extracurricular Activities. Third, describe to what extent the students' emotional intelligence is being developed in the areas of Self-Awareness, Self-Regulation, Emotional Self-Control, Flexibility, Motivation, Achievement, Well-being, and Stress Management.

The study also aimed to determine the significant relationships between the following variables: teaching practices, teachers, and students' emotional intelligence; emotional intelligence and the problems and difficulties in learning mathematics; and teaching practices and the issues and challenges associated with learning mathematics. Lastly, to determine the mediating effect of emotional intelligence on the relationship between teaching practices, problems, and difficulties in learning mathematics.

The following hypotheses were tested at .05 level of significance – there is no significant relationship between the following variables: teaching practices teachers and emotional intelligence of the students; the emotional intelligence and the problems and difficulties in learning mathematics of the students; and teaching practices and the problems and difficulties towards learning mathematics; and no mediating effect of the emotional intelligence on the relationship between teaching practices and problems and difficulties towards learning mathematics.

Research on the problems and difficulties in learning mathematics holds significant global, social, and academic value. Mathematics is a foundational subject critical to success in education, careers, and daily life. Understanding students' challenges helps address educational disparities and promotes equal access to quality learning experiences. Socially, difficulties in mathematics can lead to low self-esteem, math anxiety, and limited career opportunities, particularly in STEM fields. This research promotes equity by informing strategies that support learners from diverse backgrounds, ultimately contributing to social mobility and inclusion.

In terms of academic contribution, this research enriches the existing body of literature by exploring the cognitive, emotional, and environmental factors that hinder mathematical understanding. It guides the development of more effective teaching methods, assessments, and interventions. Locally, the findings are valuable for educators and policymakers seeking to improve instruction and student outcomes within specific communities. By identifying the root causes of learning difficulties, the research enables the development of tailored solutions that enhance classroom practices, teacher training, and resource allocation, ultimately fostering a more supportive and productive mathematics learning environment.

METHOD

Research Respondents

The study was conducted in a selected public high school in Davao del Norte. Three hundred senior high school students from selected public high schools in the Davao del Norte Division were required to

participate in this study, provided they were at least 18 years old. Random stratified sampling was used to select at least 300 students to ensure bias was avoided. It is the easiest way to perform among the probability sampling methods. It offers all respondents an equal opportunity to be selected for the study (Nguyen, Shih, Srivastava, Tirthapura, and Xu, 2021).

To be included as one of the respondents, students need to have a Mathematics subject, be in the 11th or 12th grade, and be from Technical-Vocational- Livelihood (TVL), General Academic Strand (GAS), Science, Technology, Engineering, and Mathematics (STEM), and Accountancy, Business, and Management (ABM) strands. On the other hand, students from private schools who had no Mathematics subjects and did not belong to the aforementioned strands, specifically those in 10th grade and below, were excluded from answering the questionnaires and serving as respondents. For students below 18 years old, a Child Assent Form was given beforehand so they could participate in the study. Moreover, the researcher kept respondents' answers confidential to avoid making unnecessary assumptions or drawing incorrect conclusions. Only those willing to participate in the study were greatly appreciated, and there shall be neither coercion to complete the questionnaires nor a penalty for refusal. Additionally, they were free to withdraw from the study without any penalty or risk.

Materials and Instruments

The researcher employed three sets of survey instruments adapted from previous studies to collect participant data. The researcher adapted the Emotional and Social Intelligence Questionnaire from Stellar (n.d.), which has eight indicators: Self-Awareness, Self-Regulation, Emotional Self-Control, Flexibility, Motivation, Achievement, Well-being, and Stress Management. Secondly, the problems and difficulties encountered by students in mastering learning competencies in mathematics from the study of Ganal and Guiab (2014) with six indicators namely: personal problems, emotional problems, problems on professor's instructions, problems with school adjustment, problems in adjusting to classmates or board mates, and problems arising from over-extended schedule/workloads for practice in different competitions. Lastly, the Instructional Interactions from Yoder's (2014) study include six indicators: cooperative learning/group learning, classroom discussions, self-assessment and self-reflection, balanced instruction, academic press and expectations, and competence building – encompassing modeling, practicing, feedback, and coaching.

The survey instruments were examined for reliability and validity to verify measurement accuracy. The questionnaires were pilot-tested with 30 participants who were excluded from the study. The calculated Cronbach's alpha for the independent variable, Teaching Practice, is 0.967; the dependent variable, problems and difficulties with learning mathematics, is 0.842; and the mediating variable, emotional intelligence, is 0.932, all exceeding the requisite Cronbach's Alpha value of 0.70. All three variables generated a Cronbach's Alpha of 0.853, indicating excellent internal consistency. Furthermore, external and internal validators with competence in social research and statistics authenticated the survey instrument. The validators' mean score is 4.37.

The questionnaire for the Independent Variable was assessed on a 5-point Likert Scale with the following scale: 1 (Do not implement this practice); 2 (Struggle to implement this practice); 3 (Implement this practice very well); 4 (Generally implement this practice well); and 5 (Implement extremely well). For the Dependent Variable and mediating variable, the questionnaires were assessed on a 5-point Likert Scale with the following scale: 1 or never (strongly disagrees); 2 or sometimes (disagrees); 3 or often (neither agrees nor disagrees); 4 or more often (agrees); and five or always (strongly agrees).

The following scale was used to evaluate the level of the three variables. A range of 4.20 to 5.00 (Very High) implying that the teacher implements this practice extremely well; the range of 3.40 to 4.19 (High) suggests that the teacher implements this practice well; a moderate level within the 2.60 to 3. 39 indicates that the teacher implements this practice reasonably well; within the 1.80 to 2.59 (Low) range, signifies

that the teacher has struggle in implementing this practice; and lastly, in the range of 1.00 to 1.79 (Very Low) conveys that the teacher does not implement this practice [UD3].

Design and Procedure

This study employed a descriptive-survey and correlational design to identify and analyze the problems and difficulties students encounter in learning mathematics competencies. Descriptive research is concerned with ascertaining conditions that prevail in group cases chosen for the study. It is a method for quantitatively describing a group's general characteristics. According to Creswell and Hirose (2019), survey research typically employs questionnaires and interviews, and it serves the purpose of describing current or prevailing conditions, opinions, attitudes, impressions, perceptions of a group of people, or a variety of subjects taken from representative or problem samples to infer the properties of the population.

This study employed a quantitative, non-experimental method for interrelation analysis. Researchers employ interrelation statistics to delineate and evaluate the extent of association among multiple parameters or collections of marks (Gamage, 2025). The quantitative approach was chosen for objective assessment and quantitative data analysis. Opting out of a non-experimental design was suitable as the study's objective was to observe and analyze pre-existing variables without manipulation. A correlational methodology was employed to investigate the relationship between variables, as it allows for assessing the strength and direction of the relationship without making assumptions about causality.

Additionally, the study employed mediation techniques to examine the mediating influence of the intermediary variable. Benedikt, Susło, Paplicki, and Drobnik (2020) assert that mediation analysis functions as a mechanism between the independent and dependent variables, mediating the influence of the independent variable on the dependent variable.

Furthermore, the study employed various statistical tools for data analysis. The mean was used to assess the levels of emotional intelligence, teaching practices, and problems and difficulties in mathematics. The Pearson product-moment correlation was used to determine the relationships among these variables. Multiple regression analysis was used to measure the impact of emotional intelligence on teaching practices and learning difficulties. Lastly, Medgraph with the Sobel z-test was used to examine the mediating effect of emotional intelligence on the relationship between teaching practices and students' problems and difficulties in learning mathematics.

RESULTS AND DISCUSSIONS

Level of Teaching Practices as Perceived by the Selected Senior High School Students

Shown in Table 1 are the descriptive statistics for evaluating respondents' perceptions of the level of teaching practices, with a mean of 4.15 (SD 0.94), considered high, for senior high school students. Among the indicators, competence building ($\overline{X}$=4.28, SD = 0.91) and balanced instruction ($\overline{X}$=4.22, SD = 0.83) achieved a very high descriptive level. This indicates that teachers are more focused on building students' competence through a strategic approach to delivering lessons, providing ample, effective instruction. Cooperative learning ($\overline{X}$=4.01, SD = 1.02), classroom discussion ($\overline{X}$=4.12, SD = 0.95), self-assessment ($\overline{X}$=4.17, SD = 0.93), and academic press and expectations ($\overline{X}$=4.16, SD = 0.93) are therefore the following indicators with a descriptive high level.

Table 1: Level of teaching practices

Indicators	**SD**	**Mean**	**Descriptive Level**
Competence building	0.91	4.28	Very high
Balanced instructions	0.83	4.22	Very high
Self-assessment	0.93	4.17	High
Academic press and expectations	0.93	4.16	High
Classroom discussion	0.95	4.12	High
Cooperative learning	1.02	4.01	High
Overall mean	**0.94**	**4.15**	**High**

The results show that senior high school teachers in the selected public and private high schools in Davao del Norte helped students develop social and emotional competencies systematically through the general teaching cycle, which includes lesson goals and objectives, material presentation and modeling, group and individual practice, and conclusion and reflection. As long as the instructor incorporates them into the lesson, each phase of the instructional cycle helps reinforce specific social and emotional competencies.

Balanced instruction implies an appropriate balance between individual and collaborative learning. This indicates that teachers provide each student an equal chance to absorb knowledge directly from their teachings. Students receive balanced instruction that alternates between teaching methods that suit and those that do not suit their preferences. The students are not as uncomfortable learning when that strategy is used as others may be if they were never taught in the methods they find most comfortable. However, they are occasionally taught against their preferences, which helps develop critical abilities they might never acquire if taught exclusively according to their preferences (Felder, 2018).

Self-assessment results suggest that the instructional tasks assigned by teachers require students to actively engage in thinking about their work. This means that the teachers do not simply provide the answers and let the students check whether they got the correct answer; instead, they provide opportunities for students to reflect on their thinking and learning process. Students are also asked to collaborate and provide feedback on the effectiveness of learning activities (Howell, 2021).

The academic press and expectations suggest that teachers focus on the balance between effort and results. Meanwhile, students are also expected to put in full effort, which will support them socially and emotionally while challenging them with new or higher levels of learning. When teachers raised their expectations of students and assigned them more challenging work, the students showed increases in

mathematics achievement, equivalent to a whole term's learning, according to the teacher expectation intervention study by Valdes, Denner, Dickson, and Laursen (2021) and Natavarlal (2022).

The result of the classroom discussion suggests that the teachers ask students about their peers' opinions and whether they agree with them. Consequently, the teachers also discuss the content in-depth with the students. Subsequently, cooperative learning/group learning results show that the teacher creates learning experiences in which students apply positive social learning skills to succeed. It also reveals that teachers encourage their students to work together when an assignment concern arises. These indicators, however, suggest a positive outlook on teachers' implementation of practices that enhance students' emotional skills and foster positive instructional interactions. Teachers play a key role in structuring groups and ensuring that the key components likely to facilitate successful cooperation are evident. However, they also play a role in encouraging student involvement, as research shows that, lacking instruction, students seldom offer insightful explanations or participate in intellectual conversations (Gillies, 2019; Roy, 2024; Zhou & Colomer, 2024).

Level of Problems and Difficulties Encountered by the Senior High School Students towards Learning Mathematics

Table 2 presents the descriptive and analytical results of evaluating the problems and difficulties encountered by the selected senior high school students. The same descriptive level labeled as high applies to all the indicators, which include personal problems ($\overline{X}$=3.75, SD=0.91), emotional problems ($\overline{X}$=3.76, SD=1.02), problems on the teacher's instruction ($\overline{X}$=3.94, SD=0.98), problems with school adjustment ($\overline{X}$=4.07, SD=0.99), and problems in adjusting to classmates/schoolmates ($\overline{X}$=3.84, SD=1.15). The problems arising from overly extended schedules/workloads for practice in different competitions, with the most excellent average ($\overline{X}$=3.97, SD = 1.07) among all these indicators, despite being classified as high. This suggests that pupils are overly preoccupied with various activities within and outside the classroom. They consequently lack the necessary understanding of math competencies.

The respondents have a high level of experience regarding their problems and difficulties. The results show that students struggle to complete their learning tasks effectively. This is also tied to their difficulty adjusting to their senior high school student role. They must establish a good relationship with the teachers, school campus officials, fellow students, and other school personnel.

Table 2. Level of problems and difficulties

Indicators	SD	Mean	Descriptive Level
Problems with school adjustment	0.99	4.07	High
Problems arising from over-extended schedules/workloads for practice in different competitions	1.07	3.97	`High
Problems with the teacher’s instruction	0.98	3.94	High

Problems in adjusting to classmates/schoolmates	1.15	3.84	High
Emotional problems	1.02	3.76	High
Personal problems	0.91	3.75	High
Overall mean	**1.02**	**3.87**	**High**

School adjustment plays a vital role in a student's life. It is related to the student's progress and achievement, as well as their attitudes towards school, anxieties, loneliness, social support, and academic motivation. Interpersonal relationship affects students' academic motivation (Tomás, Gutiérrez, Pastor, and Sancho, 2020; Lasarte, Díaz, Palacios, and Fernández, 2020). Perceived social support, school adaptation, and adolescents' subjective well-being. Child Indicators Research, 13(5), 1597-1617. Affiliation with peers and teachers is an influential motivator. It was noted that school learning can be promoted by learning contexts that enhance student involvement with others (Ibrahim & El Zaatari, 2020; Jamilah, 2021). Friendship supports students in the school environment and helps with their adjustment. Peers can be a source of support in dealing with problems, and students can overcome feelings of alienation (Gao, Zhang, Deng, Sun, Gao, and Chen, 2020; Shu, Ahmed, Pickett, Ayman, and McAbee, 2020).

Another issue that most senior high school students face is the pressure to achieve academically. There is a lot of pressure on pupils to perform well in school to ensure their future, including the high competition for college spaces and the insufficiency of resources. They may find it challenging to overcome this stress, which can lead to worry, difficulty concentrating on their coursework, and reduced productivity (Tus, 2020; Saqib, Hisham-Ul-Hassan, Shadab, and Mehmood, 2023; Fu, 2024). The study confirms that various issues and challenges lead to low math achievement. To many, these issues encompass personal aspects such as students' abilities and attitudes, psychological issues involving emotions, instructional concerns including teachers' methods and attitudes, family issues including finances and relationships, peer issues including students' adjustments to classmates or schoolmates, and extracurricular activities. However, with the proper support, students can overcome these challenges and achieve academic success. That is why the school, parents, and government must provide for and assist in their academic and personal development. By addressing these concerns, senior high school students can increase their chances of accomplishing their academic objectives and realizing their full potential by tackling these issues (Kumi-Yeboah, 2020; Saha, Islam, Akhi, and Saha, 2024).

Level of Emotional Intelligence of the Selected Senior High School Students

Table 3 presents the descriptive and analytical results of assessing the level of emotional intelligence, with an overall mean of 4.16 (SD = 0.90), indicating a high level. The indicators reflected a high to very high descriptive level, including self–regulation ($\overline{X}$= 4.09, SD = 0.81), emotional self–control ($\overline{X}$=4.05, SD = 0.89), flexibility ($\overline{X}$=4.07, SD = 1.04), well–being and stress management ($\overline{X}$=4.17, SD = 0.86), all of which are considered high. The other three indicators, namely, self-awareness ($\overline{X}$=4.28, SD = 0.80), motivation ($\overline{X}$=4.24, SD = 0.99), and achievement ($\overline{X}$=4.23, SD = 0.90), are labeled as very high. The outcome for these variables unequivocally demonstrates that students are clearly aware and realistic in acknowledging their skills and capabilities, despite the challenges they face. They are also highly motivated and committed to reaching their goals.

Table 3. Level of emotional intelligence

Indicators	SD	Mean	Descriptive Level
Self-awareness	0.80	4.28	Very high
Motivation	0.99	4.24	Very high
Achievement	0.90	4.23	Very high
Well-being and stress management	0.86	4.17	High
Self-regulation	0.81	4.09	High
Flexibility	1.04	4.07	High
Emotional self-control	0.89	4.05	High
Overall Mean	**0.90**	**4.16**	**High**

The overall result of these indicators shows that the respondents have a high emotional quotient, reflecting very high self–awareness, achievement, and motivation in the learning process. The respondents show confidence in facing all their challenges and are realistic about themselves. It also shows that the students acknowledge their abilities and skills, as well as their limitations and responsibilities for self-preservation. Moreover, they are also conscious of their moods and their impact on others. However, the respondents do not often see themselves as capable and talented. Research has stated that developing self–awareness, responsible decision-making, relationship skills, social awareness, and self–management is also a progression that leads to social and emotional intelligence learning (Pretorius & Plaatjies, 2023). This also links to another study, excerpted from "The Development of a Self-Awareness Skill for High School Students through the Process of Social and Emotional Learning" (Supatarayan, 2022), which suggests that social and emotional intelligence learning nurtures positive connections that enhance learning ability among students (Duchesneau, 2020).

Self–regulation among the respondents also shows that they are highly organized when pursuing their goals. The respondents demonstrate control over their impulses and reactions regarding studies and are also good and careful in handling different situations. These circumstances relate to self–regulated learning (SLR), which involves students setting personal learning goals to achieve desired learning outcomes (Lim & Yeo, 2021). This implies that senior high school students are self–directed in learning and achieving academic goals. Moreover, students tend to manage and balance their well–being to cope with stress by

having good resilience and maintaining good physical and mental well–being. They are also driven by a strong desire to pursue their goals, often being flexible in their approach (Wang & Liu, 2022).

Correlation between Teaching Practices and Problems and Difficulties encountered by students in Learning Mathematics

Shown in Table 4 is the result of the relationship between the independent variable (teaching practices) and the dependent variable (problems and difficulties encountered by students learning mathematics), as well as the mediator variable (emotional intelligence). Pearson's product-moment correlation was employed to determine the relationship between these variables.

Table 4. Significance difference between teaching practices and problems and difficulties

Pair	Variables	Correlation Coefficient	p-value	Decision
IV and DV	Teaching Practices, and Problems and difficulties encountered by students in learning Mathematics	.374**	0.000	Reject

The relationship between the variables was determined using a Pearson's r, a bivariate correlation analysis. The correlation analysis between teaching practices and problems and difficulties encountered by students in learning mathematics revealed a computed r-value of 0.374 with a probability value of $p<0.000$, which is significant at the 0.05 level. This suggests that the two variables have a moderately positive connection. Hence, the null hypothesis of no significant relationship is rejected.

Table 5. Significant difference between teaching practices and emotional intelligence

Pair	Variables	Correlation Coefficient	p-value	Decision
IV and MV	Teaching Practices and Emotional Intelligence	.458**	0.000	Reject

The relationship between the variables was determined using Pearson's r, a bivariate correlation analysis. The correlation analysis between teaching practices and emotional intelligence experienced by students in learning mathematics revealed a computed r-value of 0.458 with a probability value of $p < 0.000$, which is significant at the 0.05 level. This suggests that the two variables have a moderately positive connection. Hence, the null hypothesis of no significant relationship is rejected.

Table 6. Significance difference between emotional intelligence and problems and difficulties

Pair	Variables	Correlation Coefficient	p-value	Decision
MV and DV	Emotional Intelligence and Problems and difficulties encountered by students in learning Mathematics	.389**	0.000	Reject

The relationship between the variables was determined using a Pearson's r, a bivariate correlation analysis. The correlation analysis between emotional intelligence and problems encountered by students in learning mathematics revealed a computed r-value of 0.389 with a probability value of $p<0.000$, which is significant at the 0.05 level. This suggests that the two variables have a moderately positive connection. Hence, the null hypothesis of no significant relationship is rejected.

Correlation Analysis of the Variables

The correlation between teaching practices and the problems the senior high school respondents encountered in learning math is a multifaceted issue. The teaching styles may also correlate with these various difficulties, such as the traditional method versus active learning. Passive learning may lead to an outmoded method where the students struggle to engage with the learning itself (Mariappan, 2023). In the meantime, students' comprehension and engagement are improved through active learning. Differentiated instruction is an additional teaching strategy that enables teachers to tailor their approach to meet the diverse needs and preferences of each student, taking into account their varied interests, learning styles, and talents. Failure to differentiate instruction may leave some students behind or fail to challenge others, leading to frustration and disengagement (Park & Ramirez, 2022).

Differentiated instruction can be implemented in various ways in mathematics classrooms. One effective way to differentiate instruction is to integrate planning and teaching within small groups based on students' varying levels of learning. These levels of learning are a research-based instructional approach to teaching and differentiating mathematics that has been studied in mathematics education. Learning levels are often described as an instructional arrangement, more commonly referred to as Concrete-Representational-Abstract (CRA). This approach to differentiating instruction in math includes a sequence of instruction (van den Kieboom & Groleau, 2022) to master multifaceted concepts and algorithms in mathematics. This approach involves utilizing manipulatives or concrete objects. If the student has mastered the math concept using manipulatives, the objects are replaced with illustrative representations, such as a picture of the object. The only vital bridge in this level is between the concrete manipulatives and the abstract symbols (e.g., equations, algorithms), as this stage builds the mental schema linking these two levels. It is crucial to develop mathematical conceptual knowledge during the figurative level of learning (Patsiomitou, 2019; Ortiz, Cristia, and Cueto, 2020).

Teachers' competence, clarity in math, and ability to communicate complex ideas will significantly influence students' learning experience. Suppose a teacher lacks clear explanations and struggles to adapt teaching methods to convey particular knowledge to meet the students' needs. In that case, it can contribute to students' difficulties acquiring math concepts. Even though the outcomes are mixed, instructors' competence has gained widespread recognition in recent years as a critical component that significantly affects their teaching style or the overall quality of instruction, even though the results are not entirely consistent (Charalambous CY, 2020; Krauss et. al., 2020; Backfisch et. al., 2019). Other studies

investigated the relationship between teachers' knowledge and instructional quality while considering classroom management, student support, and cognitive activation (Baier et al., 2019; Kaiser et al., 2020)

Similarly, the second correlation analysis involving teaching practices and emotional intelligence yielded a computed r-value of 0.458 and a p-value of < 0.000, which is significant at the 0.05 level. This suggests that the two variables are strongly positively correlated. Hence, the null hypothesis of no significant relationship is rejected.

Students' teaching practices and emotional intelligence can be significant, as educators' emotional intelligence can directly influence their teaching approaches and interactions with students. The relationship between teaching practices and students' emotional intelligence (EI) is also significant, as teachers play a crucial role in developing learners' emotional skills. One effective teaching strategy that can impact students' emotional intelligence is through emotion regulation. Teachers can teach their students this crucial skill by demonstrating emotional regulation and providing modified strategies that cater to their students' needs. Students with higher emotional intelligence tend to achieve better grades and exhibit improved classroom behavior. Academic performance is also significantly enhanced by school-based interventions that focus on social and emotional development (Wang, 2023; Al Jaberi, Alzouebi, and Abu Khurma, 2024).

Lastly, the third correlational analysis between emotional intelligence and problems and difficulties encountered by students in learning mathematics yielded an r-value of 0.389 with a probability value of p<0.000, which is also significant at the 0.05 level. This suggests that the two variables are strongly positively correlated. Hence, the null hypothesis of no significant relationship is rejected.

The emotional intelligence (EI) and the problems and difficulties students encounter in learning mathematics can provide insights into how emotional competencies relate to academic challenges. Students with higher emotional intelligence may be better able to regulate their emotions, potentially reducing math anxiety. Math anxiety, characterized by fear and apprehension about mathematics, can significantly hinder learning and performance in the subject. Therefore, a negative correlation between emotional intelligence and math anxiety might be expected—the higher the emotional intelligence, the lower the math anxiety, and vice versa. Studies of del Carmen Pérez-Fuentes, Núñez, del Mar Molero, Gázquez, Rosário, and Núñez (2020) have shown that emotional regulation skills predict anxiety-related symptoms up to five years in advance, as well as future achievements, indicating that these skills may be crucial in the relationship between math anxiety and math performance. Indeed, math anxiety involves trouble controlling one's emotions (Haase, Guimarães, and Wood, 2019). For instance, in one study, highly math-anxious students showed decreased activation in areas necessary for solving mathematical problems (dorsolateral prefrontal cortex) and increased activation in competing networks associated with emotional processing (Klados, Paraskevopoulos, Pandria, and Bamidis, 2019).

Mediation Analysis of the Teaching Practices, Emotional Intelligence, and Problems and Difficulties towards Learning Mathematics

The linear regression was used to analyze the data in the med graph. As Lee, Herbert, and McAuley (2019) note, a mediation analysis examines how a third variable mediates the link between two variables. Four steps must be met for a third variable to act as a mediator. In Table 5, these are categorized as steps 1-4. In step 1, the teaching practices (the independent variable, IV) significantly predict the problems and difficulties students encounter in learning mathematics (the dependent variable, DV). In step 2, the teaching practices significantly predict emotional intelligence, which serves as the mediating variable (MV). In step 3, emotional intelligence significantly predicts students' problems and difficulties in learning mathematics.

Since the three steps (paths a, b, and c) are significant, further mediation analysis through med graph is reasonable, involving the Sobel z-test to assess the significance of the mediation effect. If the effect of the independent variable on the dependent variable is non-significant at the final step of the analysis, then complete mediation will be achieved. It means that the mediator variable mediates all the effects. Additionally, suppose the regression coefficient is substantially reduced at the final step but remains significant. In that case, only partial mediation is observed, indicating that part of the independent variable (teaching practices) is mediated by the mediator (emotional intelligence). However, other parts are either direct or mediated by other variables not included in the model. In this event, as gathered in step 4 (denoted as c'), the effect of teaching practices on problems and difficulties encountered by students in learning mathematics was even found to decrease after being mediated by emotional intelligence. This resulted in partial mediation, as the effect was significant at the 0.05 level.

Table 5. Regression results of the variables in the four criteria of the presence of a mediating effect

STEP	PATH	BETA (UNSTANDARDIZED	STANDARD ERROR	BETA (STANDARDIZED)
Step 1	C	0.425	.048	.458
Step 2	A	0.294	.042	.374
Step 3	B	0.298	.063	.253
Step 4	c'	0.337	.050	.363

Moreover, the results of the mediation analysis are shown in Figure 3. The Sobel test yielded a z-value of 3.92 with a p-value of 0.0000, indicating significance at the 0.05 level. This means that the mediating effect is partial, such that the original direct effect of teaching practices on the problems and difficulties students encounter in learning mathematics is affected by the addition of emotional intelligence.

The figure also shows the results of the computation of the effect size in the mediation test conducted between the three variables. The effect size measures how much of the effect of teaching practices on the problems and difficulties students encounter in learning mathematics can be attributed to the indirect path. The total effect value of 0.425 represents the beta coefficient of the teaching practices towards problems and difficulties related to emotional intelligence, as included in the regression. The indirect value of 0.294 is the amount of the original beta between the teaching practices and emotional intelligence that now goes through emotional intelligence to problems and difficulties (a * b, where "a" refers to the path between TP & EI and "b" refers to the path between P&D & EI).

The ratio index is computed by dividing the indirect effect by the total effect: in this case, 0.088/0.425 = 0.206. 20.6 percent of the total effect of teaching practices on problems and difficulties encountered by students in learning mathematics goes through emotional intelligence, and about 79.30 percent of the total effect is either direct or mediated by other variables not included in the model.

Based on the result, teaching practices significantly mediate problems and difficulties in learning mathematics. This reaffirms the study's implications and findings by Wink, LaRusso, and Smith (2021), which state that teachers demonstrate empathy, understanding, and patience towards students experiencing difficulties in learning mathematics. Additionally, good teachings strategies, approaches and techniques; and effective assessment procedures, follow-up activity and utilization of instructional materials, thus, make students more interested, attain mastery of the concept, develop more constructive attitude, productive discipline and advanced performance in mathematics (Al-Samarraie, Shamsuddin, and Alzahrani, 2020; MULUNGYE, 2023; Rehman, Huang, and Mahmood, 2025). The need to know and understand that differences and exceptionality among learners exist and are widespread pertains to teachers holistically. They should make every effort to make the necessary and appropriate adjustments to students' general capabilities, needs, and interests to achieve better learning outcomes. Anything the teacher does and fails to do in the classroom reflects on the learners. Understanding and applying the different principles of teaching and learning are fundamental (Goyibova, Muslimov, Sabirova, Kadirova, & Samatova, 2025).

Teachers' encouragement and constructive feedback are vital in helping students develop their emotional responses to learning complex mathematical concepts. This includes positive reinforcement and constructive feedback, even for small efforts, which can increase students' confidence and resilience in tackling mathematical challenges. Positive comments encourage students to think beyond the standard content when they perform at a high level. With feedback, teachers can inspire curiosity and encourage deeper thinking (Chiappetta, 2022). Furthermore, teaching practices that highlight problem–solving skills enhance students' critical thinking. As students confront complex mathematical problems, they learn to manage their frustration positively (Park & Ramirez, 2022).

Finally, emotional intelligence significantly mediates the problems and difficulties the senior high school students in selected schools in Davao del Norte face in learning mathematics. Emotional intelligence is positively related to students' academic achievement and serves as a crucial mediator in explaining the problems and difficulties SHS encountered in learning mathematics. In a case study entitled Emotional Intelligence and Achievement of Students in Mathematics (Ajai, 2019), it was found that the four domains of emotional intelligence, namely self–rawness, self–management, social–awareness, and relationship management, do have a positive effect on the academic achievement of students in mathematics when combined with the aggregate emotional intelligence.

CONCLUSION AND RECOMMENDATIONS

With the consideration of the findings of the study, conclusions and recommendations are drawn in this section. From the generated findings, the senior high school students of the selected public and private schools in the Davao del Norte Division reported a high level of assessment of teaching practices, problems, and difficulties encountered in learning mathematics, as well as emotional intelligence. It also implies a significant relationship between the teaching practices and the problems and difficulties the senior high school students encounter in learning mathematics in Davao del Norte. Similarly, the result suggests a significant relationship between teaching practices and emotional intelligence among senior high school students.

The mediation analysis reveals that emotional intelligence directly mediates the relationship between teaching practices and the problems and difficulties encountered by senior high schools in selected schools in Davao del Norte, specifically in relation to learning mathematics. This mediation suggests that managing students' emotional intelligence will directly impact their performance and achievement in mathematics. The study suggests that their teachers' teaching practices also directly influence students' ability to deal with the problems and difficulties they encounter.

Consequently, the study's results supported the Theory of Connectivism, which posits that the experiences of both teachers and students are shaped by the connections they establish. The mathematics classroom serves students with varying abilities and intelligence levels, requiring diverse strategies to enhance comprehension. Teaching and learning mathematics involve intricate approaches, posing challenges for educators. Effective teaching encompasses four key components: employing a variety of teaching methods, effectively using questioning techniques, guiding students in their learning, and assessing achievement of instructional objectives. Teachers should promote student engagement through investigative and hands-on activities, such as group projects and teamwork.

This study has also revealed a significant relationship between teaching practices and the problems and difficulties encountered by senior high school students in the selected schools of Davao del Norte in their learning of mathematics. The researcher recommends that teachers consider their learners' diverse learning abilities and mathematical proficiency by applying varied teaching strategies that cater to each learner's needs. In SHS Mathematics, teachers should make every effort to use effective teaching and evaluation methods, along with appropriate learning materials, to tailor lessons to their students' functional skills. Students can also address these difficulties by being highly disciplined, particularly in regulating their emotions. They may also engage in socialization activities with fellow students, using games and other social-oriented activities, such as joining the Mathematics Club, which may organize competitions tailored to students' specific problems, difficulties, and needs.

The study also shows a significant relationship between teaching practices and emotional intelligence among SHS respondents. The researcher recommends that teachers continue to foster positive reinforcement for their learners by nurturing a supportive, kind environment. They shall also provide opportunities for the students to reflect on their emotions, actions, and engagements. Consider activities such as keeping journals, actively participating in group discussions and conversations, or having a one-on-one session where students can openly convey their feelings and evaluate their emotional reactions. Another recommendation the researcher suggests is that teachers should foster partnerships with parents and guardians to strengthen the development of emotional intelligence (EI) at home. They can also provide suggestions and resources on how their parents, guardians, or family members can support emotional awareness and regulation outside the school setting.

This study revealed a significant relationship between emotional intelligence and the problems and difficulties encountered by SHS respondents in learning mathematics. The researcher further recommends that students, with the aid of their teachers, should promote a growth mindset of a positive culture, wherein the belief that mathematical abilities can be developed through perseverance and effort is clearly emphasized. Students should also help themselves set realistic goals, monitor their progress, and celebrate improvements over time. The school personnel, on the other hand, shall also ensure that students have equal access to school counselors or mental health professionals who can offer individualized support for those experiencing significant emotional difficulties in learning mathematics. These professionals can provide coping mechanisms and personalized interventions for students who have experienced such difficulties.

Since the study revealed that emotional intelligence significantly mediates the relationship between teaching practices and problems and difficulties among SHS respondents towards learning mathematics, the researcher further recommends that the school administrators shall design comprehensive programs and activities that caters both the emotional awareness of the students in dealing difficulties in learning mathematics and improve the teachers' teaching practices that will scaffold an effective strategies in delivering and administering their lessons. Teachers shall also develop individualized learning instruction (ILI) to accommodate diverse learning abilities effectively. These ILIs will include a specific outline, targeted interventions, and a progress-monitoring tool that assesses students' emotional coping mechanisms when encountering difficulties in learning mathematics.

Lastly, the mediation analysis reveals that emotional intelligence mediates the relationship between teaching practices, problems, and difficulties that SHS respondents experience in learning mathematics. The researcher recommends the full implementation of programs and intervention strategies that enhance teachers' teaching practices and develop students' emotional awareness and regulation in dealing with problems and difficulties encountered in learning mathematics.

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