



## Challenges and Opportunities in Integrating Socio-Emotional Values in Teaching Mathematics Instruction: Evidence from Rizal II District, Dinagat Islands

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### Abstract

**Purpose:** This study examined the challenges and opportunities mathematics teachers encounter in integrating socio-emotional values into their instruction in the Rizal II District of the Dinagat Islands, Philippines. The study also determined whether perceptions of challenges and opportunities differed significantly when teachers were grouped according to profile variables.

**Method:** A quantitative descriptive design was employed, involving 72 mathematics teachers from elementary and secondary schools. A validated researcher-made questionnaire with excellent reliability (Cronbach's alpha: 0.928 for challenges; 0.935 for opportunities) was used. Data were analyzed using descriptive statistics, independent sample t-tests, and one-way analysis of variance (ANOVA) at a 0.05 level of significance.

**Results:** Findings revealed that teachers perceived integration as highly challenging ( $M = 3.34$ ), particularly in linking mathematics to ethical decision-making, incorporating fairness and justice, and addressing emotional aspects of learning. Opportunities were likewise rated highly ( $M = 3.32$ ), emphasizing collaboration, empathy, resilience, and critical reflection. No significant differences were found across teachers' demographic and professional profiles.

**Conclusion:** Integrating socio-emotional values in mathematics is essential yet complex. Teachers recognize its importance but face systemic barriers, including rigid curricula, resource limitations, and lack of training. Nonetheless, their openness to innovate indicates a strong foundation for advancing socio-emotional integration.

**Implications:** The study recommends strengthening teacher professional development, developing instructional resources, and aligning curriculum policies to support socio-emotional integration in mathematics. Building collaborative platforms for teachers to share best practices may also sustain innovation and contribute to holistic learner development in the Philippine context.

**Keywords:** Socio-Emotional Values; Mathematics Education; Teacher Challenges; Instructional Opportunities; Dinagat Islands; Philippines

### 1. Introduction

Mathematics is widely recognized as a foundational discipline that underpins logical reasoning, scientific advancement, and problem-solving in everyday life. Beyond its utilitarian function, mathematics fosters critical thinking, resilience, and confidence in learners (International Commission on Mathematical Instruction [ICMI], 2024). In the Philippine educational context, mathematics remains a core subject at both elementary and secondary levels, providing essential skills for personal development and national progress (Ariyanti & Santoso, 2020). Despite its significance, persistent challenges such as declining student achievement and growing learning gaps have been observed, particularly during and after the COVID-19 pandemic (Aguhayon et al., 2023; Sooknanan

& Seemungal, 2023). These challenges highlight the need for more holistic instructional approaches that extend beyond cognitive development.

One approach gaining traction is the integration of socio-emotional values into classroom instruction. Socio-emotional values, including empathy, perseverance, and ethical decision-making, are critical to nurturing well-rounded learners capable of engaging responsibly in society (Gyamfi, 2022). Research suggests that the integration of such values enhances student motivation, strengthens interpersonal relationships, and fosters a positive learning environment (Massarwe & Gadban, 2024). However, in practice, teachers often face difficulties embedding socio-emotional values in mathematics instruction due to rigid curriculum standards, limited resources, and insufficient professional training (Seah, 2016; Yazli, 2018). These barriers underscore the complex reality of teaching mathematics in ways that develop both intellectual and socio-emotional competencies.

At the same time, opportunities exist for innovation. Studies show that when educators intentionally integrate socio-emotional values into mathematics, learners are more engaged, collaborative, and capable of connecting mathematical ideas to real-world contexts (Daher, 2020; Kyriakides et al., 2018). Such integration supports the Philippines' broader educational goals under Republic Act No. 11476, or the Good Manners and Right Conduct (GMRC) and Values Education Act, which mandates values integration across the K–12 curriculum (Academ-e, 2024). Addressing these challenges while leveraging opportunities can foster more inclusive and meaningful mathematics instruction.

This study was conducted in the Rizal II District of the Dinagat Islands to examine the challenges and opportunities faced by mathematics teachers in integrating socio-emotional values into their lessons. By investigating both constraints and enablers, the research contributes to ongoing discourse on curriculum development, teacher training, and the holistic improvement of mathematics education. The findings are intended to inform policy, support professional development programs, and inspire contextually responsive strategies for integrating socio-emotional values in Philippine mathematics classrooms.

## **Aim and Research Questions**

### **Aim**

This study aimed to examine the challenges and opportunities mathematics teachers face in integrating socio-emotional values into their instructional practices in the Rizal II District of the Dinagat Islands.

### **Research Questions**

The study was guided by the following research questions:

1. What is the profile of mathematics teachers in the Rizal II District in terms of:
  - a. age
  - b. gender
  - c. highest educational attainment
  - d. degree or major
  - e. years of teaching experience
  - f. mathematics subject(s) taught
  - g. grade level(s) taught?
2. What challenges do mathematics teachers encounter in integrating socio-emotional values into their instruction?
3. What opportunities are afforded to mathematics teachers in integrating socio-emotional values into their instruction?
4. Is there a significant difference in the challenges encountered by mathematics teachers when grouped according to their profile?

5. Is there a significant difference in the opportunities afforded to mathematics teachers when grouped according to their profile?
6. Based on the findings, what intervention program may be proposed to strengthen the integration of socio-emotional values in mathematics instruction?

### Null Hypotheses

To address the research questions, the following null hypotheses were formulated and tested at the 0.05 level of significance:

- **Ho1:** There is no significant difference in the challenges encountered by mathematics teachers in integrating socio-emotional values in their instruction when grouped according to their profile variables.
- **Ho2:** There is no significant difference in the opportunities afforded to mathematics teachers in integrating socio-emotional values in their instruction when grouped according to their profile variables.

## 2. Review of Related Literature

International assessments have continued to spotlight persistent challenges in mathematics learning, especially across low- and middle-income systems. In PISA 2022, the Philippines' average mathematics score remained far below the OECD mean, with a small share of students reaching the highest proficiency levels; performance since 2018 showed limited improvement and large equity gaps (OECD, 2023a; OECD, 2023b). Earlier grade indicators from TIMSS 2019 likewise documented low average performance in both Grade 4 and Grade 8 mathematics for participating Southeast Asian systems, reinforcing the magnitude of foundational skill deficits (Mullis et al., 2020). These convergent results underscore the need for instructional approaches that strengthen not only cognitive outcomes but also students' engagement, motivation, and confidence in mathematics.

A growing body of work has argued that integrating social and emotional learning (SEL) or values education into academic instruction can contribute to such improvement by building persistence, self-regulation, collaboration, and a sense of purpose in learning mathematics (Darling-Hammond et al., 2020; OECD, 2021a, 2021b). Transformative SEL frames these competencies as inseparable from rigorous academic work and classroom relationships, emphasizing culturally responsive, equitable practices that help students connect mathematical reasoning to real-world problems and ethical decision-making (Jagers et al., 2019; Jagers et al., 2021). International evidence from the OECD Survey on Social and Emotional Skills indicates that task-performance skills (e.g., responsibility, self-control, persistence) are positively associated with grades in mathematics, suggesting a plausible pathway through which sustained SEL integration may support achievement (OECD, 2021a).

Despite this promise, empirical studies consistently report barriers that teachers face when embedding socio-emotional values in mathematics lessons. These include rigid pacing guides and high-stakes testing pressures, limited time for explicit SEL instruction, lack of ready-to-use materials that connect mathematics to values and ethical lenses, and uneven access to professional development focused on mathematics-specific SEL practices (Darling-Hammond et al., 2022; Ryan, 2024). Implementation scholarship further shows that teachers' own adult SEL—mindsets, stress regulation, and relational skills—shapes their capacity to enact value-rich, discussion-oriented mathematics lessons (Duane & Caino, 2025; Elbertson & Jennings, 2025). Case evidence also points to the importance of classroom cultures that normalize mistakes, encourage peer support, and use reflective dialogue to surface the ethical dimensions of quantitative decision-making—conditions that can reduce math anxiety and increase engagement (McGovern, 2023).

The Philippine policy environment has explicitly mandated values education through Republic Act No. 11476 (GMRC and Values Education Act), requiring values integration across K–12 subject areas and thereby creating enabling conditions for mathematics-SEL connections (Republic Act No. 11476, 2020). Alignment challenges remain, however, because large-scale assessments and curriculum documents often privilege cognitive targets and content coverage. This policy–practice tension mirrors global patterns where systems endorse whole-child

development rhetorically, yet teachers encounter practical constraints when translating that mandate into daily mathematics instruction (OECD, 2021b; Darling-Hammond et al., 2020).

Within this international and national landscape, localized inquiry is needed to clarify what mathematics teachers actually experience as obstacles and facilitators when integrating socio-emotional values in their own classrooms. The present study addresses this gap by documenting the perceived challenges and opportunities of teachers in a Philippine district and by examining whether these perceptions vary by teacher profile—evidence intended to inform context-responsive professional learning, resource development, and school-level supports

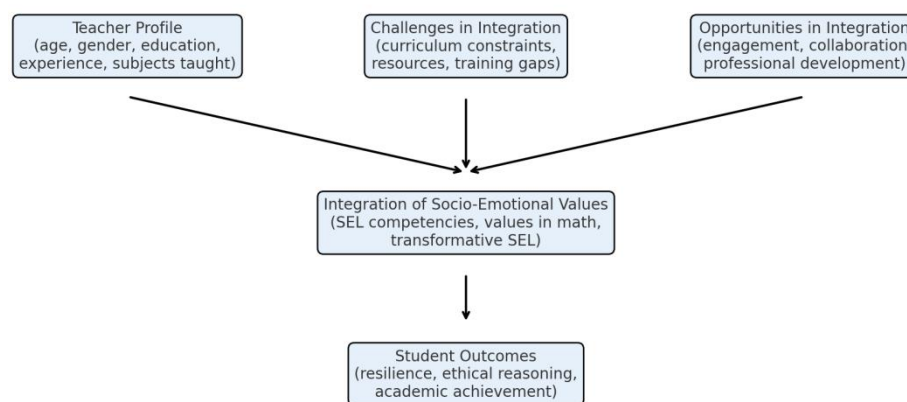
## Theoretical Framework

This study is grounded in Social and Emotional Learning (SEL) theory, which emphasizes competencies such as self-awareness, social awareness, relationship skills, self-management, and responsible decision-making (CASEL, 2020). These competencies provide a lens for understanding how mathematics instruction can go beyond cognitive skill development to foster resilience, empathy, and ethical reasoning, thereby supporting holistic student growth.

The integration of socio-emotional values in mathematics also aligns with the Values in Mathematics Education Framework (Seah, 2016), which identifies values such as honesty, perseverance, and fairness as inherently linked to mathematical practices. However, embedding these values in classroom teaching remains challenging due to curriculum constraints, limited resources, and lack of professional preparation (Tapsir & Pa, 2017). This highlights the need for structured support systems to help teachers reconcile curriculum demands with value-based instruction.

The Transformative Social and Emotional Learning (T-SEL) approach situates socio-emotional integration within equity and inclusion, viewing classrooms as spaces to nurture both cognitive and affective capacities (Jagers et al., 2019). Research shows that embedding socio-emotional learning in mathematics enhances student engagement and motivation (Gyamfi, 2022). This theoretical foundation frames the present study's inquiry into teachers' challenges and opportunities in Rizal II District, providing a basis for developing contextually appropriate interventions.

## Conceptual Framework



**Figure 1. Schematic Diagram of Conceptual Framework**

Figure 1 is the schematic diagram of the theoretical framework of the study. The model illustrates how teacher profiles influence both the challenges and opportunities in integrating socio-emotional values into mathematics instruction. These factors converge in the integration process, shaped by SEL theory (CASEL, 2020), the Values in

Mathematics Education Framework (Seah, 2016), and Transformative SEL (Jagers et al., 2019), ultimately contributing to student outcomes such as resilience, ethical reasoning, and academic achievement (Gyamfi, 2022).

### 3. Methodology

#### Research Design

This study employed a quantitative descriptive research design to examine the challenges and opportunities mathematics teachers face in integrating socio-emotional values into classroom instruction. A descriptive design was considered appropriate as it enabled the systematic collection of quantifiable data on teachers' experiences and perceptions, providing a basis for analysis and interpretation (Creswell & Creswell, 2018).

#### Respondents and Sampling

The respondents comprised 72 mathematics teachers from the Rizal II District of the Dinagat Islands, representing both elementary and secondary levels. Universal sampling was applied, including all mathematics teachers in the district during the school year 2024–2025. This approach ensured comprehensive coverage of the target population, enhancing the representativeness and reliability of findings.

#### Research Instrument

Data were collected using a researcher-developed questionnaire that consisted of three sections. The first section elicited demographic and professional information, including age, gender, educational attainment, degree or major, teaching experience, subjects handled, and grade levels taught. The second section measured the challenges encountered in integrating socio-emotional values, while the third section measured the opportunities available for integration. Items were rated on a four-point Likert scale, with separate interpretations for challenges and opportunities.

The instrument underwent expert validation and pilot testing, and internal consistency was assessed using Cronbach's alpha. Reliability analysis yielded coefficients of 0.928 for the challenges scale and 0.935 for the opportunities scale, both of which exceed the threshold for excellent reliability (Tavakol & Dennick, 2011).

#### Data Gathering Procedure

Formal approval to conduct the study was secured from the Schools Division of Dinagat Islands, including endorsements from the District Supervisor and school heads. After obtaining consent, questionnaires were distributed and retrieved personally by the researcher. Respondents were assured of anonymity and confidentiality in line with ethical research standards.

#### Ethical Considerations

The study adhered to ethical principles of voluntary participation, confidentiality, and respect for participants' rights, consistent with the Philippine Data Privacy Act of 2012 (Republic Act No. 10173). Respondents were informed of the study's purpose and their right to withdraw at any time. No identifying information was disclosed, and responses were used strictly for research purposes.

#### Data Analysis

Data were processed using descriptive and inferential statistics. Frequency counts and percentages were used to describe respondents' profiles, while weighted means and standard deviations summarized their responses on challenges and opportunities. To test the hypotheses, independent sample t-tests were used to examine

differences by gender, and analysis of variance (ANOVA) was applied to assess differences based on other profile variables. A 0.05 level of significance was used as the decision criterion.

#### 4. Results and Discussions

##### Profile of Respondents

**Table 1. Profile of Respondents (n = 72)**

| Profile Variable       | Category                          | f  | %    |
|------------------------|-----------------------------------|----|------|
| Age                    | 26–30 / 36–40                     | 18 | 25.0 |
|                        | 31–35                             | 11 | 15.3 |
|                        | 41–45                             | 10 | 13.9 |
|                        | 46–50                             | 5  | 6.9  |
|                        | 51–55                             | 2  | 2.8  |
|                        | 56–60                             | 6  | 8.3  |
|                        | 61–65                             | 2  | 2.8  |
| Sex                    | Male                              | 16 | 22.2 |
|                        | Female                            | 56 | 77.8 |
| Educational Attainment | Bachelor's degree                 | 23 | 31.9 |
|                        | MA units                          | 47 | 65.3 |
|                        | Master's / Doctorate units        | 2  | 2.8  |
| Degree/Major           | Generalist                        | 40 | 55.6 |
|                        | Mathematics                       | 12 | 16.7 |
|                        | English                           | 11 | 15.3 |
|                        | Educational Management            | 5  | 6.9  |
|                        | Others (Filipino, Social Studies) | 4  | 5.6  |
|                        |                                   |    |      |
| Teaching Experience    | < 5 years                         | 11 | 15.3 |
|                        | 5–10 years                        | 31 | 43.1 |
|                        | 11–15 years                       | 14 | 19.4 |
|                        | > 15 years                        | 16 | 22.2 |

Table 1 presents the demographic and professional characteristics of the 72 mathematics teachers in Rizal II District. A majority were female (77.78%) and most had earned graduate units (65.28%). More than two-fifths (43.06%) had 5–10 years of teaching experience, and over half (55.56%) were generalists by academic major. The predominance of mid-career teachers with graduate training suggests strong professional capacity. Similar demographic patterns were noted by Refugio et al. (2020), who emphasized that sustained professional development enhances teachers' pedagogical readiness. This context is critical when considering their approaches to socio-emotional integration.

##### Challenges in Integration

**Table 2. Challenges in Integrating Socio-Emotional Values**

| Indicators                                         | Mean | Interpretation     |
|----------------------------------------------------|------|--------------------|
| Incorporating fairness and justice in math lessons | 3.49 | Highly Challenging |
| Linking math to ethical decision-making            | 3.43 | Highly Challenging |

| Indicators                                    | Mean        | Interpretation     |
|-----------------------------------------------|-------------|--------------------|
| Addressing emotional aspects of learning math | 3.26        | Highly Challenging |
| Lack of resources and teaching materials      | 3.38        | Highly Challenging |
| Overall Mean                                  | <b>3.34</b> | Highly Challenging |

Table 2 shows the challenges encountered in integrating socio-emotional values. Teachers strongly agreed that incorporating discussions on fairness and justice ( $M = 3.49$ ) and creating ethical connections in mathematical decisions ( $M = 3.43$ ) were highly challenging. The overall weighted mean ( $M = 3.34$ ,  $SD = 0.39$ ) indicated that challenges were generally perceived as high. These findings affirm earlier work noting that teachers face barriers such as rigid curricula, standardized testing, and limited training (Seah, 2016; Yazli, 2018). Teachers in this study acknowledged the importance of socio-emotional integration but highlighted the absence of concrete strategies and materials. This suggests a gap between policy expectations, such as the GMRC and Values Education Act (Republic Act No. 11476, 2020), and classroom realities.

### Opportunities in Integration

**Table 3. Opportunities in Integrating Socio-Emotional Values**

| Indicators                                                 | Mean        | Interpretation |
|------------------------------------------------------------|-------------|----------------|
| Fostering collaboration and teamwork                       | 3.41        | Very Likely    |
| Building empathy and understanding through problem-solving | 3.35        | Very Likely    |
| Developing responsibility and resilience in learning math  | 3.33        | Very Likely    |
| Encouraging critical reflection on societal issues         | 3.28        | Very Likely    |
| Overall Mean                                               | <b>3.32</b> | Very Likely    |

Despite challenges, teachers also identified opportunities. Table 3 shows that promoting collaboration, empathy, and responsibility through mathematics lessons was viewed as highly possible ( $M = 3.41$ ). The overall mean ( $M = 3.32$ ,  $SD = 0.42$ ) suggests that opportunities were rated as very likely. These results align with studies suggesting that socio-emotional integration increases learner motivation and engagement (Daher, 2020; Gyamfi, 2022). Teachers appear willing to innovate by connecting mathematical content to real-life ethical and social contexts. This resonates with Transformative SEL, which positions classrooms as spaces for cultivating empathy and equity (Jagers et al., 2019).

### Differences by Profile Variables

Analysis using t-tests and ANOVA revealed no significant differences in the challenges and opportunities reported when grouped by sex, age, degree, or teaching experience. This suggests that the experience of integrating socio-emotional values is broadly shared across demographic groups. Similar findings were reported in studies where teacher perceptions of integration were shaped less by individual characteristics and more by systemic factors such as curriculum policy and institutional support (Massarwe & Gadban, 2024).

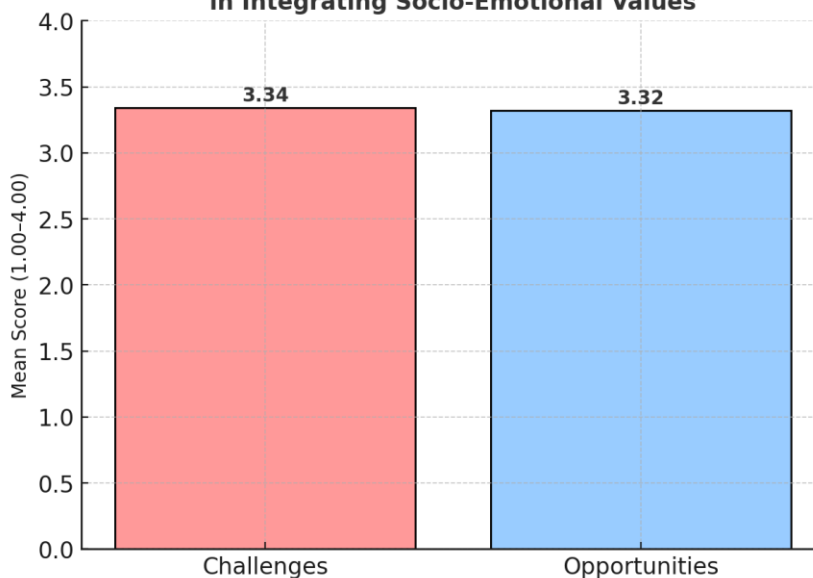
### Discussion

Overall, findings indicate that mathematics teachers in Rizal II District recognize both the difficulty and the potential of integrating socio-emotional values. Challenges were primarily structural—curriculum pressures, assessment demands, and lack of resources—consistent with international literature highlighting systemic barriers to SEL integration (OECD, 2021a; Darling-Hammond et al., 2022). At the same time, opportunities were framed in terms of pedagogy and classroom culture, reflecting teachers' willingness to innovate when supported.

The balance between challenges and opportunities underscores the importance of professional development, resource provision, and supportive school leadership. As Tavakol and Dennick (2011) emphasized, teacher

preparedness strongly affects instructional practices. Unless systemic supports are strengthened, socio-emotional integration risks remaining aspirational rather than operational in mathematics classrooms.

**Figure 2. Comparative Mean Scores of Challenges and Opportunities in Integrating Socio-Emotional Values**



**Figure 2. Comparative Mean Scores of Challenges and Opportunities in Integrating Socio-Emotional Values**

Figure 2 is the comparative mean scores of challenges and opportunities in integrating socio-emotional values in mathematics instruction. The figure shows that teachers rated both challenges ( $M = 3.34$ ) and opportunities ( $M = 3.32$ ) at a high level, indicating that while integration is perceived as difficult due to structural and curricular constraints, teachers also recognize its strong potential for fostering collaboration, empathy, and resilience.

## 5. Conclusion and Recommendations

This study investigated the challenges and opportunities mathematics teachers in the Rizal II District of the Dinagat Islands face when integrating socio-emotional values into their instruction. Findings revealed that teachers perceived integration as highly challenging, particularly in aligning values with curriculum standards, addressing emotional aspects of learning, and sourcing appropriate instructional materials. At the same time, teachers identified meaningful opportunities to foster empathy, collaboration, and resilience through mathematics lessons. Importantly, no significant differences were found in teachers' perceptions when grouped by profile, suggesting that the challenges and opportunities encountered are shared broadly across demographic categories.

The results affirm that integrating socio-emotional values in mathematics is both necessary and complex. Teachers' recognition of its importance reflects alignment with global calls to embed socio-emotional learning into academic subjects to promote holistic student development (OECD, 2021a; Gyamfi, 2022). However, systemic barriers such as limited resources, rigid curricula, and insufficient training continue to hinder full implementation. Without targeted institutional support, integration risks remaining an aspiration rather than a classroom reality.

Based on these findings, several recommendations are advanced. First, professional development programs should be designed to strengthen teachers' capacity to embed socio-emotional values into mathematics lessons. These programs must provide concrete strategies, model lessons, and assessment tools aligned with the Philippine curriculum and Republic Act No. 11476 (GMRC and Values Education Act). Second, school administrators should allocate resources for instructional materials that explicitly link mathematics concepts to real-world ethical and social issues. This would reduce teachers' reliance on improvisation and enhance lesson relevance. Third, collaborative learning platforms should be established within the district to allow teachers to share best practices,

classroom innovations, and reflections on integrating socio-emotional learning in mathematics. Such communities of practice can strengthen peer support and foster sustainable change. Finally, policy makers and education supervisors are encouraged to incorporate socio-emotional learning objectives explicitly into curriculum guides and assessment frameworks, ensuring coherence between policy intentions and classroom realities.

In conclusion, the integration of socio-emotional values in mathematics offers both significant challenges and promising opportunities. While systemic barriers remain, the willingness of teachers to innovate demonstrates a strong foundation for progress. By addressing structural constraints and providing targeted support, mathematics education in the Philippines can move toward a more holistic model—one that cultivates not only cognitive proficiency but also ethical reasoning, emotional resilience, and responsible citizenship among learners.

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