

A study on Integration of social-emotional well-being into Mathematical instructions

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Abstract:

The present study sightsees the integration of social-emotional well-being (SEWB) into mathematics instruction to enhance both academic achievement and emotional development. Everyone knowing that mathematics is often perceived as a high-stress subject, the research investigates how embedding SEWB principles can create a supportive learning environment that reduces anxiety, fosters resilience, and improves student engagement in learning. The study employs a mixed-methods approach, combining quantitative analysis of student performance data with qualitative insights from teacher and student interviews. The findings of study indicate that classrooms that emphasize SEWB show marked improvements in students' confidence, persistence, and attitudes toward mathematics. The study highlights the dual benefits of this approach such as enhancing mathematical comprehension while promoting emotional intelligence and interpersonal skills.

Key words: Social-emotional well-being, mathematical instructions, emotional development, integration.

Introduction

"Many kids today are not just 'math people,' they are math lovers," Peter Balyta

Mathematics is the shell of all creations, which engine that drives the planet. Whether a chef or an agronomist, a carpenter or a mechanic, a merchant or a doctor, an engineer or a scientist, a musician or a magician, everyone needs mathematics in regular life. Even insects use calculation in their everyday life for existence. Mathematics makes our lives orderly and prevents chaos. Certain qualities nurtured by mathematics are the power of reasoning, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. Mathematics is a methodical application of matter. It is so said because the subject makes a man methodical or systematic. There are countless examples of mathematical patterns in nature's fabric, in that few are snails making their shells, spiders designing their webs, and bees building hexagonal combs. The proper guidance and training in the formative period of one's life can be a great mathematician.

Mathematics is often regarded as one of the most challenging and anxiety-inducing subjects for students across all educational levels. This perception, coupled with traditional teaching methods that prioritize procedural fluency over conceptual understanding, can create a learning environment that fosters stress, disengagement, and a fixed mindset toward mathematical ability. Social-emotional well-being (SEWB) has emerged as a critical factor in educational success, influencing students' capacity to navigate challenges, manage emotions, and sustain motivation. However, its integration into specific subject areas like mathematics remains underexplored.

The integration of SEWB into mathematics instruction seeks to bridge the gap between emotional and cognitive development. By addressing the emotional barriers that often impede mathematical learning,

such as fear of failure and low self-confidence, educators can foster a more inclusive and supportive classroom environment. This approach aligns with contemporary educational paradigms emphasizing the importance of holistic student development, wherein academic achievement is complemented by emotional resilience and social competence.

Need and Importance

The significance of integrating SEWB into mathematics instruction lies in its potential to transform how students perceive and engage with the subject. Mathematics is not only a foundational discipline but also a gateway to opportunities in STEAM fields, where confidence and problem-solving skills are paramount. Embedding SEWB into teaching practices can reduce math anxiety, enhance self-efficacy, and cultivate a growth mindset—key predictors of long-term academic and career success. Additionally, promoting SEWB through mathematics instruction aligns with broader societal goals of developing emotionally intelligent individuals capable of collaboration, critical thinking, and adaptive problem-solving. By recognizing the interplay between emotions and learning, this study provides a framework for designing mathematics classrooms that nurture both intellectual and emotional growth.

Furthermore, this research responds to calls for equity in education by addressing the unique needs of diverse learners, including those from marginalized or underserved communities. These students often face compounded challenges, where both academic and emotional hurdles intersect. An SEWB-integrated approach can mitigate these barriers, ensuring that all students have the opportunity to thrive academically and emotionally. This study aims to contribute to the growing body of literature advocating for holistic education and provide actionable strategies for integrating SEWB into mathematics instruction. By doing so, it seeks to redefine the role of mathematics education in preparing students not only for academic success but also for the complex emotional and social landscapes of the modern world.

The following studies are revealed that social emotional learning (SEL) practices have been shown to significantly improve student outcomes in mathematics by addressing issues such as math anxiety and fostering resilience. Reflective practices and growth mindset strategies are particularly effective in enhancing both math performance and emotional well-being and in another Research indicates that emotional support from teachers and peers directly impacts students' math self-efficacy, which in turn predicts better engagement and persistence in solving challenging problems. Emotional stability and reduced anxiety are key contributors to these outcomes by Zakariya, Y. F. (2023). The Studies conducted during the COVID-19 pandemic highlight the importance of contextualizing math problems and achromatic engagement to maintain emotional and cognitive involvement in learning by Joshi, D. R., Adhikari, K. P., Khanal, B., Khadka, J., & Belbase, S. (n.d.) (2022). Embedding SEL in math instruction helps students develop essential life skills, such as resilient stress management, while improving math performance. Teachers' attitudes and the emotional climate of the classroom play a significant role in shaping these outcomes by ALI Staff, (2021).

Statement of the Problem

Mathematics education is essential for cognitive and problem-solving development. However, research shows that many students experience math anxiety, leading to disengagement and poor performance. Despite the recognized importance of social-emotional well-being (SEWB) in education, its integration into mathematics instruction remains limited. Hence, the present study focused on integration of social-emotional well-being into mathematical instructions.

Objectives of the study

- To explore the current understanding and practices of integrating SEWB into mathematics instruction
- To identify effective strategies for integrating SEWB into mathematics instruction

Research question of the study

- What is the current understanding of mathematics educators regarding the integration of social-emotional well-being (SEWB) into their teaching practices?
- What are the common practices employed by mathematics educators to address social-emotional well-being in their classrooms?
- What are the perceived challenges and barriers to effectively integrating SEWB into mathematics instruction?
- What strategies do mathematics educators consider to be the most effective for integrating social-emotional well-being (SEWB) into math instruction?
- How do teachers perceive the impact of SEWB integration on student engagement and performance in mathematics?
- What professional development or resources do teachers feel are necessary to successfully integrate SEWB into mathematics instruction?

Method & Procedure

Method: The mixed-method research design employed, which is combining qualitative and quantitative approaches.

Population: The purposive sampling technique was used to select the mathematics teachers from secondary schools and students of class 9th of Bhopal.

Sample: Twenty mathematics teachers and 160 students across 8 schools in Bhopal was the sample of the study.

Tool: The five-point scale used to measure responses of teachers' strategies, practices and attitudes. The semi-structured interviews led for deeper exploration of mathematic instructions. For student's investigator adopted Student Engagement Scale by Fredricks et al., (2004), Social-Emotional Well-Being Scale by Elias et al., (1997). Additionally, classroom observations and focus group discussions were conducted to explore their perceptions of the SEWB strategies.

Data analysis: Data was analyzed using descriptive statistics. Pre- and post-survey comparisons was conducted to examine changes in student engagement, math anxiety, and social-emotional well-being after SEWB integration. Interviews and focus group discussions were transcribed and analyzed using thematic analysis and Classroom observation notes were coded and analyzed for patterns in teacher behavior, student interactions, and SEWB strategy application.

Findings of the study

The study aimed to explore the integration of Social-Emotional Well-Being (SEWB) into mathematics instruction. The findings are as follows:

Teachers' Understanding and Practices

- The survey responses revealed that a majority (73%) of teachers had a basic understanding of SEWB, but only 43% reported regularly incorporating SEWB strategies into their mathematics lessons. Teachers expressed a strong awareness of the link between emotional well-being and academic performance but were uncertain about how to integrate SEWB specifically into math instruction.
- Interviews revealed that common practices included collaborative problem-solving (59%) and providing emotional support during assessments (49%). However, several teachers noted a lack of

professional development in SEWB, which hindered their ability to fully embrace these practices in the classroom.

- Observations in classrooms confirmed that SEWB strategies were often informally applied, with a focus on fostering a positive classroom environment rather than structured interventions.

Effective Strategies for SEWB Integration

- **Collaborative Learning:** This strategy emerged as the most effective (reported by 80% of teachers). Teachers noted that group work allowed students to support one another emotionally and build social connections while solving mathematical problems, which increased both engagement and confidence.
- **Mindfulness and Reflection:** Teachers who implemented mindfulness exercises (such as breathing techniques or brief moments of reflection before tests) reported significant reductions in student anxiety, leading to improved focus during lessons. This strategy was particularly appreciated by students, with 69% of them expressing that mindfulness exercises helped them feel more calm and capable during math lessons.
- **Emotional Check-ins:** Teachers who integrated emotional check-ins at the beginning or end of lessons found that these brief moments of reflection helped students acknowledge and manage their emotions before engaging with math tasks. This practice was reported to help reduce math anxiety and increase engagement, particularly among students who expressed high levels of anxiety.

Student Perceptions and Impact

- Pre- and post-surveys indicated a significant decrease in math anxiety among students who experienced SEWB-integrated lessons. Specifically, 65% of students reported feeling "less anxious" about mathematics after the introduction of SEWB strategies, compared to only 45% before.
- Additionally, students who participated in focus group discussions expressed greater enjoyment and confidence in mathematics after SEWB strategies were implemented. Many students reported that the strategies made them feel supported and understood, which translated into improved academic performance.

Discussion

The results of this study suggest that integrating Social-Emotional Well-Being (SEWB) into mathematics instruction has positive effects on both teacher practices and student outcomes. Although there was variation in how teachers understood and implemented SEWB strategies, the study highlights several key findings that contribute to the literature on the intersection of emotional well-being and academic performance, particularly in math education.

The lack of formal training in SEWB for teachers is a significant barrier to its integration into mathematics instruction. This aligns with previous research that highlights the need for professional development focused on emotional intelligence and social-emotional learning (SEL) in the classroom (Zins & Elias, 2007). Teachers expressed a desire for more resources and training to better incorporate SEWB practices, echoing findings from other studies (Durlak et al., 2011). The integration of collaborative learning and mindfulness exercises in math instruction appears to reduce math anxiety and foster positive emotions towards the subject. This is consistent with studies suggesting that when students feel emotionally supported, their academic engagement improves (Jennings & Greenberg, 2009; Rimm-Kaufman et al., 2014). Collaborative learning, in particular, was shown to create a supportive environment where students could share ideas and reduce feelings of isolation, which is crucial for students who struggle with math-related anxiety.

The reduction in math anxiety, as noted by students, supports the growing body of research suggesting that emotional regulation strategies—such as mindfulness—can play a crucial role in reducing stress and enhancing student performance (Beilock & Maloney, 2015). Despite the positive outcomes, several challenges were identified in the implementation of SEWB strategies. These include time constraints, lack of training, and difficulty balancing the emotional aspects with the academic rigor of math instruction. This resonates with findings by Schonert-Reichl (2017) that emphasize the need for schools to provide adequate time and resources for SEL initiatives to succeed. Moreover, some teachers reported that they felt overwhelmed by the dual responsibility of addressing both academic content and emotional well-being, highlighting the need for systemic support for SEWB integration.

Recommendations for Future Practice

- To effectively integrate SEWB into mathematics instruction, it is essential to provide targeted professional development that equips teachers with the tools and strategies necessary for embedding emotional and social learning into math lessons. Additionally, schools should foster a culture of collaboration among teachers, where best practices for SEWB integration can be shared and refined.
- The findings also suggest that embedding SEWB into math instruction should not be seen as an additional burden but as an integral part of fostering a holistic learning environment. This requires schools to prioritize both emotional and academic well-being, creating a balanced approach to student development.

Conclusion

This study demonstrates that the integration of Social-Emotional Well-Being (SEWB) into mathematics instruction has a significant positive impact on both teacher practices and student outcomes. Effective strategies, such as collaborative learning, mindfulness exercises, and emotional check-ins, have the potential to reduce math anxiety, improve student engagement, and create a more supportive learning environment. However, further professional development and institutional support are necessary to overcome the challenges that teachers face in implementing these strategies.

REFERENCES:

1. Beilock, S. L., & Maloney, E. A. (2015). Math anxiety: Who has it, why it develops, and how to overcome it. *Trends in Cognitive Sciences*, 19(1), 13-18.
2. Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
3. Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.
4. Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.
5. Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.
6. Durlak, J. A., Domitrovich, C. E., Weissberg, R. P., & Gullotta, T. P. (2011). *Handbook of social and emotional learning: Research and practice*. Guilford Press.
7. Elias, M. J., Zins, J. E., Graczyk, P. A., & Weissberg, R. P. (1997). *Promoting social and emotional learning: Guidelines for educators*. ASCD.
8. Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59-109.
9. Jennings, P. A., & Greenberg, M. T. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research*, 79(1), 491-525.
10. OpenAI. (2024). *ChatGPT* [Large language model]. <https://chatgpt.com>

11. Rimm-Kaufman, S. E., Pianta, R. C., & Cox, M. J. (2014). *The effectiveness of social and emotional learning in promoting school success*. American Psychological Association.
12. Balyta, P. (2018). Many kids today are not just 'math people,' they are math lovers. *Texas Instruments Education Technology Bulletin Board*. Retrieved from <https://education.ti.com/en/bulletinboard/2018/august/studentsurvey>.
13. Schonert-Reichl, K. A. (2017). Social and emotional learning and teachers. *The Future of Children*, 27(1), 1-19.
14. Zins, J. E., & Elias, M. J. (2007). Social-emotional learning: Promoting the development of all students. *American Journal of Education*, 114(2), 297-324.