

## INTEGRATING SOCIAL EMOTIONAL LEARNING (SEL) INTO MATHEMATICS TEACHER PREPARATION: A TRAUMA-INFORMED APPROACH

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*In this study, we investigated preservice mathematics teachers' growth and application of their emotional intelligence skills after participating in monthly social emotional learning (SEL) workshops for an academic year. SEL workshops were led by a local nonprofit specializing in universal prevention tools for systemic changes that benefit individuals and communities. We interviewed three preservice teachers who participated in all the workshops about their experiences with SEL skills in their personal lives, practicum experiences, and how they will use it in their future classrooms. We found the most common SEL competency areas they discussed were responsible decision making and social awareness. The undergraduate preservice mathematics teachers were clearly able to identify instances in both their personal and professional lives where they observed SEL skills being used.*

Keywords: Affect, Emotions, Beliefs, and Attitudes; Instructional Activities and Practices; Communication; Preservice Teacher Education

In the United States there is a national shortage of mathematics teachers, and it is even more difficult to hire and keep highly qualified mathematics teachers in rural areas (Monk, 2007). This was especially true in our area, so we applied for, and received, a grant from the National Science Foundation to give full support to sixteen preservice teachers for the last two years of school if they double major in mathematics and mathematics education. In addition, they must participate in two learning community events each month during the school year. One of these learning community events would take place with our local nonprofit, Peacemakers Resources. Our relationship with this nonprofit represents a collaboration between our university and a partner in our local community to build trauma-informed approaches in schools. During the monthly meetings, the staff and students would learn about Social Emotional Learning (SEL) and how to use SEL skills in their classrooms.

Researchers (Felitti, 2002; Shonkoff, Boyce, & McEwen, 2009) have documented adverse child experiences (ACEs) and trauma impact how students' brains develop and function. Subsequent researchers have found teaching social emotional learning to students can reverse the effects of chronic stress (Thompson, 2014). Additionally, Ottmar et al. (2015) stated teachers trained in SEL are more capable of perusing ambitious mathematics teaching and Durlak et al. (2011) found students showed an 11 percentile-point gain on standardized achievement tests. Because of this research, we incorporated the SEL training into our teacher preparation project. We created this partnership to help prepare our preservice teachers to engage all students and design learning environments that take students' emotional and learning needs into account.

Lamberg, T., & Moss, D. (2023). *Proceedings of the forty-fifth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (Vol. 1). University of Nevada, Reno.

## Research Question

The following question guided our research study: how have preservice teachers demonstrated growth and application of their emotional intelligence skills after participating in an SEL learning community for one year?

## Theoretical Framework

Learning happens through social practices and people construct their understanding of ideas through active participation in learning communities. Communities of practice (CoP) (Wenger, 1998) was our theoretical framework for this study. When people are learning, they are “active participants in the practices of social communities and constructing identities in relation to these communities” (Wenger, 1998, p. 4). Our preservice teachers engaged in a required SEL learning community for one year as part of their teacher preparation project. They had shared experiences centered around their mathematics coursework, SEL workshops, and learning community activities. The community of practice framework guided the organization and structure of our teacher preparation project with eight preservice teachers.

## Methods

As part of a five-year long grant project on preparing preservice teachers to teach mathematics in high need rural areas, we investigated three of the preservice teachers’ growth and application of their SEL training. These students completed their junior year at a public university in the Midwest. The students double majored in mathematics and secondary mathematics education. All three students participated in the community of practice activities, including the SEL workshops with the local nonprofit. The first workshop was a full day training to introduce them to the impacts of trauma on brain development, ACEs, historical trauma, and strategies to build resilience (SEL). They then participated in monthly two-hour workshops on integrating SEL skills for personal and professional practice. At the end of the academic year and the workshops, we interviewed three preservice teachers using semi-structured interviews (Glesne, 2011). The interviews were each completed with one preservice teacher, two of the researchers who participated in the SEL trainings, and the leader of the SEL training.

Each interview lasted approximately twenty minutes. We allowed for discussion around each question and follow up. We asked the preservice teachers four questions:

1. How are you using what you learned in our SEL sessions in your personal life?
2. How are you seeing SEL in your practicum experiences?
3. What is your vision for incorporating SEL into your future classroom?
4. Do you have any suggestions for the SEL training next year?

The interviews were videotaped and transcribed. We recruited a faculty member from the Social Work department at our university with expertise in SEL to join our research team, then together we created an analytic framework (see Table 1) based on work from the Collaborative for Academic, Social, and Emotional Learning (CASEL, 2022). We used CASEL’s five broad but interrelated competency areas of SEL. We then used CASEL’s examples of each of the five categories as subcodes (common examples).

After creating the analytic framework, we examined all the transcripts as a team of three (two researchers who participated in the SEL training and social work faculty member) and used the framework to document anytime a student discussed SEL. We first documented it as one of the

five competency areas followed by a common example. We did this process together, getting one hundred percent agreement before moving on. We coded two of the interviews a second time to check for consistency. We then tallied each time we documented a competency area during the interview.

**Table 1: Social Emotional Learning Competencies**

Competency	Definition	Common Examples
Self-Awareness	Accurately recognizing one’s emotions and thoughts, and their influence on behavior	Self-efficacy; growth mindset; sense of purpose
Self-Management	Regulating thoughts, emotions, and behaviors in different situations and being able to set and achieve personal and academic goals	Courage to take initiative; setting personal and collective goals; identifying and using stress-management techniques
Social awareness	Taking the perspective of and empathizing with others from diverse backgrounds	Empathy and compassion; showing concerns for other’s feelings; taking others’ perspectives
Relationship skills	Establishing and maintaining constructive relationships with diverse individuals and groups	Developing positive relationships; communicating effectively; collaborative problem-solving
Responsible decision-making	Making ethical and respectful choices about personal behavior and social interactions	Demonstrating curiosity and open-mindedness; making reasoned judgment after analyzing information; evaluating impacts

### Results and Discussion

During analysis, we coded each time the preservice teachers shared things related to the five SEL competency areas and the 40 corresponding examples (CASEL, 2022). Through analysis, we found social awareness and responsible decision-making were the most common competency areas discussed by the preservice teachers (see Table 2).

**Table 2: Competency Frequency by Preservice Teacher**

	Self-Awareness	Self-Management	Social Awareness	Relationship Skills	Responsible Decision-Making
Katie	4	6	9	8	7
Lola	2	5	3	3	7
Noah	3	4	10	0	9
Total	9	15	22	11	23

## **Self-Awareness**

We documented a total of nine comments fitting the definition of self-awareness making it the least frequently observed. The most common expressions of self-awareness included self-efficacy, growth mindset, and sense of purpose. Noah demonstrated a growth mindset in reflecting on how he is seeing SEL in his practicum experiences. After discussing successful and unsuccessful teachers he has observed during this time, Noah reflected on the positive teachers he has observed:

Noah: I am kind of observing practices I want to use as a future teacher. And because I've had kind of the experiences, learning about the SEL stuff, I know what to look for and know what works and why it works and stuff like that.

This is an example of Noah showing a growth mindset in relation to his self-awareness.

Katie also demonstrated several examples of self-awareness. When speaking about how the SEL trainings have influenced her, she demonstrated a growth mindset, a sense of purpose, and self-efficacy in reflecting on her experiences:

Katie: Another thing I felt like when I got into mathematics, I was more introverted, and (these) experiences definitely made me more extroverted and like I feel better to express opinions and like answer questions in class. And it just made me a better student as well and person.

Author: Why do you think that is? I am just curious.

Katie: Well, I think in a way like the first couple of SEL sessions that we had just kind of like forced me out of my bubble. Like, here is all these new people, talk to them. So seeing that like, oh, that went well. Like, I actually made connections really well. Like it just gave me the confidence I needed.

This understanding of self-awareness is important because recognizing one's strengths and limitations leads to professional identity formation as a new mathematics educator. It is important for them to have a strong sense of self-efficacy and a growth mindset.

## **Self-Management**

Self-management builds upon self-awareness. This was the third most common SEL competency area the preservice teachers discussed during their interviews. The most common expressions of self-management were identifying and using stress-management strategies, showing the courage to take initiative, self-management skills, and setting personal and collective goals. We documented self-management 15 times.

Lola had five instances where she showed reflection on self-management. An example of this in relation to stress management was when she spoke about needing to take breaks, breathe, and doing hot yoga since starting the SEL trainings:

Lola: I definitely take a break and breathe sometimes. So, I definitely use those mindful moments. Also, just like expressing my emotions more rather than just bottling it up all the time. So, that is how I use it in my personal life. I also just do like breathing exercise more to calm down and stuff so. There was a lot of deep breathing this morning.

Author: Is this a new thing or have you always done it?

Lola: No, I haven't done that before, and I also started taking hot yoga as I feel there is a lot of SEL in that.

Katie displayed six instances of self-management. Her discussions around self-management focused on her showing the courage to take initiative and setting personal and collective goals for her future classroom. Katie spoke of wanting to be attentive to her students' needs. After speaking about a teacher, she observed who was very attentive to what students might need she said:

Katie: I want to incorporate that, but I guess that's more on me. That's more of like a personality trait than it is something that I incorporate into my classroom.

Katie was also very reflective on how she viewed the future SEL workshops the next year. She spoke of the importance of getting to know the new eight preservice teachers who would be joining the group.

Noah also spoke of ideas related to self-management four different times during his interview. While sharing how he is using what he learned in his personal life, Noah reflected how it is important:

Noah: Knowing what makes me happy and how can I add more of that to life.

Noah identified aspects of a trauma-informed classroom that prioritizes students' wellbeing and self-regulation:

Noah: I'm going to just create a classroom environment where students feel like they are set up for success. They know I want their success; they know their peers want them to succeed and stuff like that. And this taking time throughout the day, even though it feels like there's a lot to get done in a class to get the students into the mindset of learning before getting into the learning.

The preservice teachers reflected on the how they were using or would use self-management skills in their personal lives or future classrooms. Demonstrating personal and collective agency is essential to a diversity-informed mathematics education environment where all students can thrive.

### **Social Awareness**

Documented 22 times, social awareness was the second most common theme of the SEL competencies during the interviews. Common occurrences of social awareness were taking others' perspectives, showing concern for the feelings of others, and showing empathy and compassion for others.

When Noah was asked about how he is using SEL skills after the trainings in his personal life he demonstrated taking others' perspectives:

Noah: I think overall it is just kind of being more mindful of kind of like the place where other people are coming from. I mean, with my job, I work with a bunch of students from different backgrounds and things like that. And it is kind of just taking a step back and thinking about, okay, what are they going through? What are their motivations behind their actions and stuff like that, and kind of seeing them as people rather than the problems or the successes they have and stuff like that.

When Noah was asked about using SEL in his future classroom he stated:

Noah: Just seeing students as students and as people who have backgrounds.

Noah's last statement represents a critical element of trauma informed pedagogy. Social awareness reflects educators' ability to ensure their students are felt and heard in the classroom.

### **Relationship Skills**

We found students mentioned ideas related to relationship skills a total of 11 times making it the fourth most observed SEL competency. Noah did not have any instances where he mentioned ideas related to relationship skills. The times we documented relationship skills for both Lola and Katie were focused around communicating effectively, developing positive relationships, and practicing collaborative problem-solving.

Lola spoke of a teacher she observed several times and how they had an active learning classroom environment that she would like to implement when she begins teaching. This is an example of collaboratively solving a mathematics problem together at the whiteboard, she said:

Lola: Like the kids are at a whiteboard and they are communicating with one another. And one student has a marker, so there is only one person writing. So, it is more communication based.

Katie also had eight instances where she spoke related to relationship skills. Many of the ideas were how the training had influenced her in her personal life and as a student. She spoke of resolving conflicts constructively. First, she reflected on how the SEL workshops had influenced her ability to manage her relationships with her roommates. She said:

Katie: Now instead of like yelling at them to do the dishes I can understand. You didn't do the dishes like maybe we should have a conversation about this.

Katie also spoke of how the learning community activities have helped her develop positive relationships:

Katie: Well, I think in a way like the first couple of sessions that we had just kind of like forced me out of my bubble. Like, here's all these new people talk to them. So, seeing that like, oh, that went well. Like I actually made connections really well. Like it just gave me the confidence I needed.

We found this to be a powerful statement of the positive aspect of developing relationship skills. Central to developing a healthy classroom community, relationship management skills reflect the ability to constructively engage with diverse groups.

### **Responsible Decision-Making**

Documented 23 times, responsible decision-making was the most common competency when the preservice teachers were discussing their noticing and learning of SEL skills. Common occurrences of this were identifying solutions for personal and social problems, reflecting on one's role to promote community well-being through reflecting on SEL skills, demonstrating curiosity and open-mindedness to shifting perspective and evaluating the idea of interpersonal impacts.

Lola spoke about ideas she wanted to do in her future classroom in relation to how she would help build a community of students. She stated:

Lola: I personally would like to help students make their own agreements to like what their core values are. What they want to see in their classroom.

When Katie was reflecting on what she has learned through the SEL trainings, she explained how her mindset has shifted from how she would start the school year with her future students.

Katie: At first, I feel like I was a little scared to take an entire week not devoted to math. I feel like a lot of opinions that I've heard are like you got to start with the math. You don't have enough time in the year to get through it all. But, then like what we've been talking about with like mindful moments and then when the teacher came in to talk about how she uses that week, like, I am not scared of it anymore. Like, the math can wait a week.

Katie demonstrated curiosity and open-mindedness to shifting her perspective of how the first few days of school should look and evaluated the idea of interpersonal impacts. A few minutes later Katie reflected on the trainings:

Katie: The only thing left was that I feel like this is giving me a good perspective of what teaching is and I've seen more that it's not just about teaching content. It's not just about math. It's about connections and meaningful relationships.

Noah also reflected on how the SEL sessions might influence his future classroom. Noah reflected:

Noah: I feel like my own classroom feels so far away even though it really isn't. So, I should be thinking about these things, but I'm not thinking about these things all the time and I'm kind of the person where I'm like, I don't know what I don't know until I need to know that. I'm like, I should have thought about that before. So, it's definitely been nice to kind of have this experience to think ahead, kind of reflection on what I want my classroom to look like and kind of emulate some of the positive experiences I've observed and had in classrooms.

The most common theme we found in relation to the preservice teachers' reflections of SEL skills was responsible decision-making. When reflecting on things they learned throughout the academic year and through their field experiences they found many examples of SEL. They made reasoned judgements, and demonstrated curiosity and open-mindedness based on what they saw and learned, ultimately embracing their role in promoting personal, family, and community well-being.

### **Conclusions**

Researchers (e.g., Durlak et al., 2011; Ottmar et al., 2015) have documented the importance of training preservice teachers in SEL. Our preservice mathematics teachers participated in monthly SEL workshops. After one year, the preservice teachers demonstrated growth in their emotional intelligence skills in relation to the five broad SEL categories (CASEL, 2022). The most common competency areas in which they spoke of growth were social awareness and responsible decision making. Social awareness is critical because it will allow a teacher to be cognizant of their students and understand and empathize with students from diverse backgrounds. Responsible decision making is important because it supports teachers in making caring and constructive choices that benefit the collective well-being and promote student learning for all students.

Our teacher preparation project created a learning community where students were active participants. Through these experiences the students demonstrated growth in different ways. Katie spoke of how the participation made her a better student and gave her the confidence to be

more outgoing and build more relationships as a mathematics student. Noah shared that the experiences have allowed him to see students as people rather than problems. Lola shared she was better able to manage stress after the trainings. While all three of the interviewed students learned and grew in different ways, we found the learning community participation and SEL workshops to be extremely beneficial for the students and us as the authors.

This training helped preservice teachers design classroom environments that take students and learning into account, including students with a history of trauma exposure. The dearth of literature regarding the integration of SEL content in preservice teacher education calls for the articulation of methods that both successfully build SEL skills and pedagogical approaches. In this case, a CoP approach was used that paired personal integration of SEL practices with professional identity formation. Preservice mathematics educators indicated emerging personal SEL skills that integrated well with their pedagogical formation. With this study, our preservice teachers also documented a growth in skills central to resiliency that will support them in persisting in rural mathematics education positions.

### Acknowledgments

Work on this project was supported by the National Science Foundation under Grant No. 1949915. The opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the funding agencies. We would also like to acknowledge the nonprofit, Peacemakers Resources, for the support and learning opportunities of this project.

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