

Strengthening Mathematical and Professional Identities of Future K-12 Teachers

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Introduction

As mathematics teacher educators, we currently mentor a few of our students sporadically and informally outside of class by checking in, inviting them to lead presentations and otherwise participate in professional experiences, and writing reference letters to support their job search or graduate school applications.

Because we do not systematically reflect on whom and how we mentor, we may support the systemic oppression that permeates our educational system and, more specifically, mathematics education. Intentionally mentoring our traditionally underserved students (e.g., students of color, students from low-income families, first-generation college students, students whose first language is not English) means systematically examining our practices to identify ways in which they implicitly raise barriers to equitable opportunities.

In this presentation, we will share research design of the mentoring program, challenges in recruiting preservice teacher (PST) mentees, and how we adapted to the situation. We will also share insights gained from a survey on what would be an ideal mentoring program for these PSTs.

Participants

- K-8 preservice teachers
- Enrolled in
 - Math 2008: Foundations in Numbers and Operations
 - Math 3032: Foundations of Data Analysis and Geometry
 - Math 3360: Modern Geometry
 - Math 5135: Algebraic Connections for K-8 Teachers

Mentors

- Early career faculty (pre-tenure and recently tenured)
- Collaborative community pre-established
- All have mentoring experiences

Project Design

- Planned to recruit 6 mentees
- Use frameworks such as growth mindsets (e.g., Boaler, 2015; Dweck, 2008) and metacognitive learning strategies (e.g., McGuire, 2015) to support our mentees' development of mathematical and professional identities

Project Design (Cont.)

- Encourage a growth mindset in our classes and a sense of belonging and purpose through opportunities (with pay) they might not otherwise have.
- We initially planned, in collaboration with the Academic Success Center (ASC), for mentees to work 12.5 hours weekly to:
 - Meet with their mentor 1 hour a week
 - Prepare and present teaching strategies at local mathematics conferences for teachers
 - Create and lead tasks with K-12 students at university-level STEM days
 - Tutor students and/or lead study groups to support success of students in mathematics courses for teachers

Challenges

- Lack of funding from the ASC prevented mentees to get paid 12.5 hours weekly
- No students applied for the mentee positions in Fall 2021

Adapted to Challenges

- Modified recruitment email to clarify expectations
- Re-sent recruitment email to underrepresented students
- Designed and conducted surveys in all our courses about what students expect in a mentor-mentee program
- Used survey results to inform our program design
- Engaged in face-to-face talks with students to explain the purposes of the Mentoring Program
- Reduced the weekly hours from 12.5 to 5 hours per week

Methods

Data Sources

- Google Form Survey
 - sent to students near the end of Fall 2021
 - anonymous
 - voluntary and no incentives

Design of Instrument

- 13 questions; 3 open-ended
- Questions focused on:
 - Students identifying themselves as from traditionally underserved communities or not,
 - Prior experience in a mentoring program
 - Modality preferences for weekly meetings with potential mentors
 - Students' ideas for an ideal mentoring program

Methods (Cont.)

Data Analysis

- Researchers independently read and reread data, identified themes, shared, and resolved discrepancies through discussion
- Goal was not generalizability, but to inform our recruitment and mentoring to be more effective for Spring 2022

Early Findings

Common themes for what students imagine would be part of a mentoring program focused on supporting them as a future teacher who will teach mathematics as part of their work:

- Safe environment
- Build relationships
- Different ways or activities to teach
- Learning about resources or tools to use
- In summary of multiple variations, helping to prepare for our future classroom
- Practicing teaching math
- Gain support, could work with current math teachers in school system
- Life things like placement, future job, furthering education
- Study groups/ sharing experiences
- Expectations for the career
- How to help all students we may teach
- Gain confidence in abilities
- accountability/ reliability partner to check work
- Mental wellbeing such as dealing with overwhelm and stress

Some Success

- Able to recruit 7 mentees (1 more than anticipated) for Spring 2022

Conclusions

- **Implications:** The application process can be intimidating to applicants, especially those who are from traditionally underserved backgrounds.
- **Next steps:** Implement the mentoring program in Spring 2022

References

- Boaler, J. (2015). *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*. John Wiley & Sons.
- Dweck, C. S. (2008). *Mindset: The new psychology of success*. Random House Digital, Inc..
- McGuire, S. Y. (2015). *Teach students how to learn: Strategies you can incorporate into any course to improve student metacognition, study skills, and motivation*. Stylus Publishing, LLC.