Volume 11 Issue 2

September 2021

Journal of Mathematics Teacher Education in Texas

Online Journal of the Association of Mathematics Teacher Educators in Texas

President's Message

Sarah Smitherman Pratt

In the midst of these continued trying times, I am finding moments of joy and hope. One example of a moment of joy for me was the time we shared during the AMTE-TX Annual Business Meeting. I enjoyed seeing so many of you and hearing how life is going. I am hopeful that we can continue fostering our connections with each other. Relationships are essential for us as humans.

Another moment of joy for me was when the Board tried out a platform that allows individuals to circulate and converse with others in virtual space. The Fall Conference Leadership Committee plans to use this platform to facilitate opportunities for informal interactions during the conference. It will be a great way to catch up with each other and have casual interactions between sessions. This is just one of the many wonderful aspects of the 2021 Fall Conference, which will be held on September 18, 2021. Registration is open now, so please sign up today! I am hopeful that our time together will be filled with lots of laughter as well as intellectual conversations. I know we all need both.

Continued…

What's Inside…

President's Message

As we shift to more in-person activities, I would like to have you consider what you have learned from the past 18 months with respect to mathematics teacher education that you wish to maintain moving forward. What did you need to change, and how can it be adapted as you resume teaching and learning face-to-face?

To answer this question for myself, I wanted to find ways to facilitate activities that mimic what had been completed in person. For example, I learned how to use Jamboard for groups to create a shared poster in response to a prompt. As a collective, we then had a "gallery walk" to view the different boards generated by each group. I liked how Jamboard connects easily with other resources and websites. From this experience, I plan to continue using this program moving forward as it is an easier way to manage the group boards and also maintain a record for review and reflection after the session.

Even more fun is that some of our colleagues have also engaged in the use of Jamboards for their instruction. Check out the essay in this issue of *JMTET* to read how Rachel Harrington, Shannon Driskell, Ann Wheeler, and Steve Rhine are integrating Jamboard during virtual learning. They offer guidance and suggestions for us all to consider.

I would love to hear what others have learned and how to apply it in the future. Feel free to call out @AmteTX and tweet your thoughts! Follow on Facebook and Twitter to view what your colleagues have to say. Let's find ways to spread joy and hope all year long. I look forward to connecting with you all at the 2021 Fall Conference. See you there!

Upcoming Conferences

Upcoming Conferences

September 18, 2021	AMTE-TX Fall Conference	Virtual
September 20–22, 2021	NCSM Annual Conference	Virtual
September 22–25, 2021	NCTM Annual Conference	Cancelled
October 4–8, 2021	NCTM Research Conference	Virtual
October 14–17, 2021	PME-NA Conference	Philadelphia
October 28–31, 2021	AMATYC Conference	Phoenix
January 5–8, 2022	Joint Mathematics Meetings	Seattle
February 10–12, 2022	26th Annual AMTE Conference	Las Vegas
March 3–5, 2022	RCML Conference	Grapevine, TX

A Message from the Co-Editors

Dear Colleagues and Friends,

I, Yasemin Gunpinar, wanted to let you know that I am resigning my co-editor position at the *Journal of Mathematics Teacher Education in Texas* (JMTET) and this summer issue will be my last issue. I would like to thank Dr. Cody Patterson first. He has been a creative entrepreneur and a dedicated professional within the world of academia in general. He is a diamond in the JMTET leadership team. Truly. Second, I want to thank Dr. Jen Chauvot, bedrock of the journal. She continues to be a fountain of wisdom and a powerhouse of appropriate actions to support our journal. I learned a lot in this process with having support from these two wonderful colleagues.

I also want to thank Dr. Sarah Pratt, our president, and leadership team with their excellent support as well as math and math educators community in Texas. It has been an honor to work with you and to be a part of the team. Thank you for everything you have done and continue to do to make this journal worthwhile. Please continue to do your excellent work you do to teach and learn mathematics as also stated in our mission statement: "to promote the improvement of mathematics teacher education in all its aspects in the State of Texas."

For this issue, we have invited conference presenters from AMTE-TX to provide summaries of their presentations, and we're pleased to be able to share a few from our Texas mathematics teacher education colleagues, including submissions from Nirmala Naresh, Karisma Morton, and Colleen Eddy; Rebecca Dibbs; and NCTM President Trena Wilkerson.

Also, we asked for brief letters from you on addressing what lessons you and your colleagues have learned from scholarship, teaching, and service in a pandemic year that you think we should carry into our future work. We are happy to share one in this issue: "A Tool That Stood the Test of a Pandemic," by Rachel A. Harrington, Shannon O. Driskell, Ann M. Wheeler, and Steve Rhine.

Finally, we would like to present the manuscript titled as "The University of Texas at Arlington Project ECHO® Rural Texas Mathematics Teacher Professional Development" by Candace Joswick in this summer issue.

If you have something to share with our community, whether an innovation in a course or program for mathematics teachers, progress from an ongoing research project, or a suggestion about how we can support AMTE's commitment to equity and effective practice, please consider submitting a four-page manuscript for an upcoming issue of JMTET! Submission instructions can be found at our journal's homepage, https://amte-tx.com/online-journal-2/.

Best wishes,
Yasemin Gunpinar and Cody Patterson, Co-Editors
Journal of Mathematics Teacher Education in Texas

The University of Texas at Arlington Project ECHO®: Rural Texas Mathematics Teacher Professional Development

Candace Joswick
University of Texas at Arlington

Audrey Meador
West Texas A&M University

"Many rural schools have wonderful things to offer. They give you individual attention and they're caring places where everybody knows each other. But too often rural schools are made to struggle across the country." Alan Richard, Rural Schools and Community Trust board member (Phillips, 2019)

Policymakers and educators have identified professional development as key to improving teacher quality (Dash et al., 2014; Wilson, 2011). Yet, "[t]he goal of 'teacher quality for all' is proving difficult to achieve in many countries, especially in rural areas" (Robinson, 2008). Geographic location and cost are barriers to teacher professional development in rural areas. Given that teacher quality is perhaps the most important factor in student performance (Hanushek, 2011; Rice, 2003), access to high-quality and effective teacher professional development inarguably deserves attention.

Key Challenges to be Addressed by Teacher Professional Development

Geographic location and funding contribute to issues of teacher professional isolation and retention, found in recurring reports of challenges faced by rural schools including those in the state of Texas (e.g., Ingersoll, 2001; Ulferts, 2016). While categorization of school types varies by reporting agency, the Texas Education Association (TEA, 2020) classifies approximately 38% of all public school districts as rural (446 total districts in the 2018-19 school year), with Texas having more rural schools than any other state in the continental U.S. (Texas Rural Schools Task Force, TRSTF, 2017). The Rural School and Community Trust survey of teachers and teaching conditions in rural Texas (2004) reported that there is more turnover among rural teachers in Texas than their rural teacher counterparts in other states. "While myriad issues contribute to teachers' decisions to leave their rural schools or the profession altogether, feelings of isolation contribute significantly" (Kline et al., 2013; TRSTF, 2017).

Roosevelt Nivens, Superintendent of Community Independent School District in Nevada, Texas and member of TRSTF explained to KERA News, "In a large school district, for instance, you may have three different teachers that teach Algebra I. Education is a very collaborative profession, and so those algebra teachers can all talk, they can collaborate, they can talk about best practices. But in my [rural] school district, I have one teacher that teaches Algebra I, and so she doesn't have the access to her peers that also teach Algebra 1. So that isolation is simply [not having] that collaborative piece with people that do the same thing I do on a daily basis — not just teach but teach my subject" (Martin, 2017). As mathematics teachers and educators, we are acutely aware of the ongoing need to address mathematics teaching and learning in the U.S. (Woodward, 2004).

Elevating Opportunities for Rural Texas Mathematics Teacher Professional Development: One Contribution

We contend that our newly established *University of Texas at Arlington (UTA) ECHO® for Education* is well suited to support rural Texas teachers at no cost to them or their schools. Project ECHO® Education Networks are a hub-and-spoke knowledge-sharing model: that is, a hub, like UTA, organizes a virtual professional learning community through which participants gain access to experts in the field to increase educator capacity and application of best practices. Project ECHO® is "committed to addressing the needs of the most vulnerable populations by equipping communities with the right knowledge, at the right place, at the right time" (*echo.unm.edu);* that is, technology is

is leveraged for subject matter experts to share knowledge with rural practitioners, and a network of similarly situated practitioners is formed, from which they can draw support. Our education-based ECHO® supports the Texas Rural Schools Task Force (2017) recommendation to "[c]reate ways to share best practices among rural schools across the state [of Texas] to foster the spread of innovation and achievement" (Recommendation 12).

Our First UTA ECHO® Network: Early Childhood Mathematics Teaching and Learning

Early mathematics competencies are the strongest predictor of later school achievement (Siegler et al., 2012); thus, the importance of mathematics teaching and learning in pre-kindergarten, often called "the most formative year in a child's development," is indisputable. In the state of Texas, generally only the most vulnerable student populations are eligible for pre-kindergarten programs in public schools, accounting for nearly 10,000 students in rural pre-kindergarten in Texas in the 2018–19 year (TEA). Thus, in the 2021–22 school year, we offer a UTA ECHO® network specifically tailored to and open to all pre-kindergarten educators in rural Texas. Network session topics include developmentally appropriate activities (e.g., the use of learning trajectories), formative assessment, and meeting the changing landscape of education modalities during the current global pandemic. Particular emphases are placed on providing time and space for teachers to build effective relationships with colleagues to address feelings of professional isolation.

The 'Doing More with Less' Rural School Asset: An Especially Promising Domain for Increasing Equitable Access to Professional Development

Recruiting and retaining teachers are among the challenges facing rural schools. For example, some rural communities are becoming increasingly impoverished (Robson et al., 2019); shrinking enrollment and school funding based on a declining tax base is especially problematic in Texas (Bigham et al., 2014). Yet recent research (Robson et al., 2019) suggests that rural schools are finding strategies for 'doing more with less,' a clear asset.

According to National Assessment of Educational Progress data from 2007-2009 (Robson, et al., 2019), rural students consistently have proficiency rates in mathematics and reading above those of their counterparts in towns and cities (though consistently below those of their suburban counterparts). Further, rural students graduate from public high schools at higher rates than their counterparts in city, town, and suburb schools and communities (National Center for Education Statistics, Robson, et al., 2019). This leads to student matriculation to two- and four-year colleges. The rates of enrollment at two-year colleges are consistent with those of students from other areas, though two-year degree completion rates are higher among rural students. Rural students' four-year degree completion rates are higher than those of their urban counterparts (National Student Clearinghouse Research Center, Robson, et al., 2019). We anticipate that these promising outcomes may only be raised further by elevating opportunities for rural Texas mathematics' teacher professional development. *UTA ECHO® for Education* increases access to the "right knowledge, at the right place, at the right time" for teachers in rural schools in Texas.

Join In!

Interested teachers and educators across Texas are invited to reach out to Candace Joswick (candace.joswick@uta.edu) to get involved in the 2021–22 professional development. Plans for expanding the *UTA ECHO® for Education* network offerings are underway.

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Jamboards: A Tool that Stood the Test of a Pandemic

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During the COVID pandemic, online learning became an integral part of the educational experience at all academic levels. Every educator had to embrace the idea of online teaching, which took on a variety of forms depending on the comfort level of the instructor and students. Many mathematics educators had to find a way to teach preservice teachers (PSTs) independent of the in-person, hands-on mathematics tools most had become accustomed to in our classrooms. In this article, we will describe lessons we have learned from this move to online teaching and how we used a technology tool, Google Jamboards, in our mathematics education instruction.

Jamboards (https://jamboard.google.com) are digital interactive whiteboards available as a Google app in which users can draw/erase on the whiteboard; add a sticky note, image, or text box; and insert shapes. This unique tool allowed students to engage with mathematics content (Content Knowledge), while modeling effective problem solving pedagogy (Pedagogical Knowledge) in a digital environment (Technological Knowledge): the components of Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006; Niess, 2005).

Our remote synchronous elementary mathematics methods class was structured around the eight Effective Mathematics Teaching Practices as identified by the National Council of Teachers of Mathematics (NCTM, 2014). Specifically, students were learning to *Implement Tasks that Promote Reasoning and Problem Solving* (Huinker, Bill, & Smith, 2017). They completed the Addition Strings Module, discussing number strings as a teaching routine (NCTM, 2021). In breakout rooms, they shared solutions and documented group thinking on a Jamboard accessible to the class (see Figure 1).

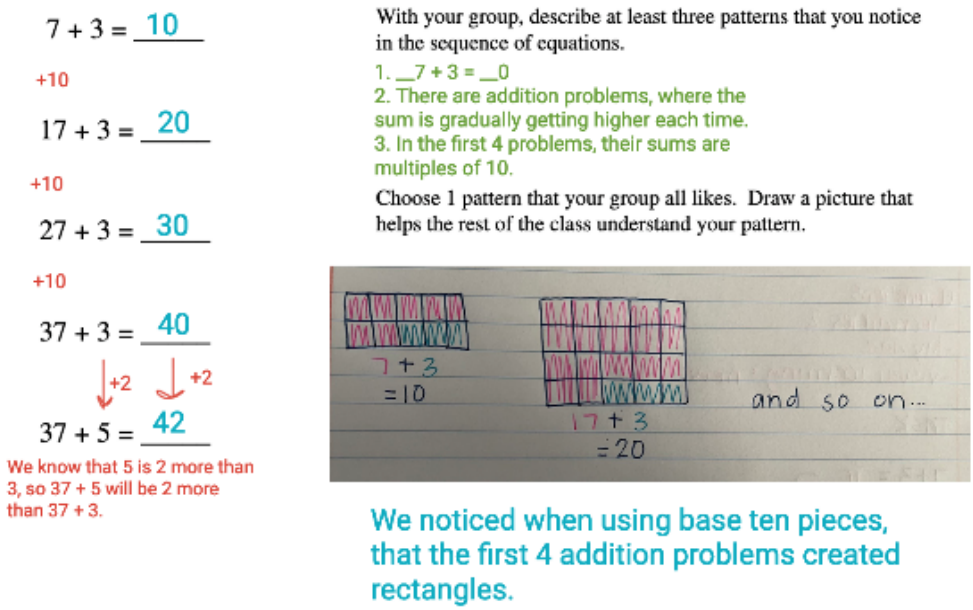

Figure 1. Jamboard documenting group work.

A few weeks later, the class was focused on *Facilitating Meaningful Math Discourse* (Huinker, Bill, & Smith, 2017). Students returned to the Addition Strings Jamboard to browse the work of their peers, and then “Select” and “Sequence” the work they would want shared in a hypothetical class. They also planned specific “Connections" they would make between the different solutions. The Jamboards allowed for students to easily access all of the groups’ work. This digitized work was now more accessible during class and could be shared later in the term or with future classes.

The archived work stored in the Jamboards provided numerous learning opportunities. Students referred back to in-class and group work to build on their understanding while doing homework and future tasks. Unique solutions to tasks became accessible to other sections of the class and upcoming terms. Error analysis and questioning strategies were able to be discussed on a wider range of student work. When students were practicing Selecting/Sequencing/Connecting solutions (practices for leading effective math discussion; see Smith & Stein, 2011), digitized work was a rich resource for discussions.

Although emergency remote learning was not the ideal teaching setting, we did gain some benefits from this experience. We found that using Jamboards was beneficial for student learning and a value-added tool that we intend to continue to use as we return to in-person learning. This simple, yet powerful tool afforded us the ability to easily share activities, quickly monitor group work, and access that work for class analysis.

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Catalyzing Change in Mathematics: Initiating Critical Conversations and Broadening Partnerships to Support Mathematics Teacher Education

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In our session at the Association Mathematics Teacher Educators (AMTE) 2021 Annual Conference, we explored ways of broadening partnerships as Mathematics Teacher Educators (MTEs) to address challenges and opportunities in PK–12 mathematics education. Our approach focused on the four key recommendations from the National Council of Teachers of Mathematics' (NCTM) *Catalyzing Change* series (2018, 2020a, 2020b). The session was guided by four questions:

- What critical conversations do I want to begin and why?
- Who could/should I consider as partners, stakeholders and collaborators in those conversations?
- How can I engage in building partnerships?
- What are the challenges/barriers and benefits?

A brief overview of the four recommendations from NCTM's *Catalyzing Change* was provided, and participants engaged in small group discussions and whole group sharing to consider partnership benefits, challenges, barriers and opportunities. We closed by sharing actionable steps to take in building partnerships to support aspects of the recommendations.

As the session started, participants were asked: Who are your partners in mathematics teacher education? See Figure 1 for responses shared. When asked what they noticed about the graphic, participants responded that teachers were central and that many different groups were involved in the work. When asked what they wondered, several participants shared questions such as "Why are parents missing?" and "Where is the community?" They also noted the complexity of working across all of these stakeholders.

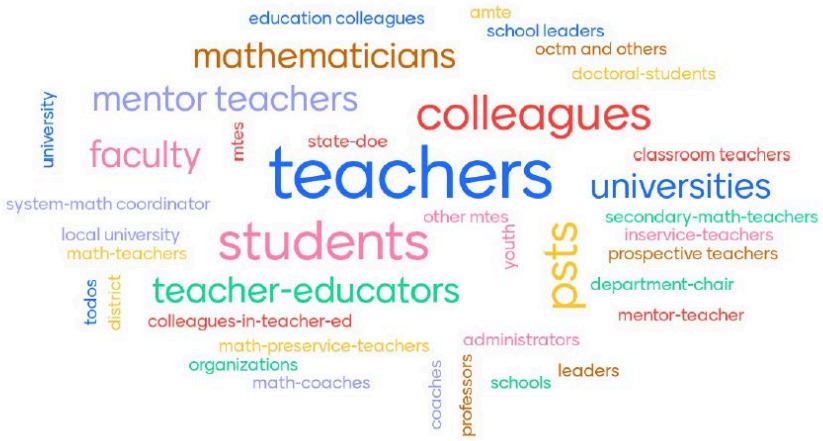

Figure 1. Partners in mathematics teacher education. (Mentimeter: https://www.mentimeter.com)

NCTM's *Catalyzing Change* series (2018, 2020a, 2020b) identifies four recommendations for PK–12 mathematics across three grade bands: early childhood, middle school, and high school. They are: Broaden the Purposes of Learning Mathematics, Create Equitable Structures in Mathematics, Implement Equitable Mathematics Instruction, and Develop Deep Mathematical Understanding. As

each recommendation (see handout) was discussed, considerations of connections between and among the recommendations and implications for mathematics teacher education were addressed. Participants reflected on current work that could inform these recommendations and also considered future studies needed to examine the potential impact of the recommendations on teaching and learning mathematics.

Participants also considered how current teacher education programs address these recommendations and how they as MTEs can empower preservice and inservice teachers in this work to elevate their voices. Multiple aspects of the AMTE *Standards for Preparing Teachers of Mathematics* (AMTE, 2017) align well with and have implications for aspects of the *Catalyzing Change* (NCTM 2018, 2020a & 2020b) recommendations. One of the underlying assumptions from the AMTE Standards emphasizes the role and need of multiple stakeholders in partnerships and also identifies stakeholder roles (AMTE 2017). It is essential to develop these partnerships.

In closing, participants identified potential next steps or actions they could take to build partnerships to support mathematics teacher education (see Figure 2). Both *Catalyzing Change* (NCTM 2018, 2020a & 2020b) and *Standards for Preparing Teachers of Mathematics* (AMTE, 2017) offer examples as well. "Enacting long-term impactful change will require time, collaboration, communication, and hard work across many different stakeholder groups. In the end, it will be worth it." (NCTM, 2020b, p. 100). We as MTEs have a significant role in building partnerships. We must work together.

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Figure 2. Potential actions to build partnerships. (Google Jamboard image)

An MTE Collective to (Re)humanize Mathematics in Preservice Teacher Education Courses

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The Standards for Preparing Teachers of Mathematics (AMTE, 2017) emphasize that tenets of equity, diversity, and social justice need to be a common thread in any math teacher education program. For pre-service teachers (PSTs) to better understand that their role is to serve as an advocate for each learner, teacher preparation programs must consistently provide opportunities to engage in critical reflection on their beliefs about mathematics and its teaching. It is equally important for Mathematics teacher educators (MTEs) to engage in critical inquiry of their own biases, assumptions, and teaching practices to become advocates for and to provide more empathetic mathematics learning experiences for PSTs. We briefly describe how we attended to these principles explicitly in our teacher education courses, using these as a space to transform PSTs' traditionally held perceptions and beliefs about mathematics.

The research fields of Culturally Responsive Mathematics Education (Gay, 2000, 2018) and Critical Mathematics Education (Skovsmose, 1985, 2011) inform and inspire our practice-based and research pursuits. Within this, we use rehumanizing mathematics (Gutierrez, 2018) as a framework to position and discuss our work with PSTs. Most of the literature on rehumanizing mathematics (RM) focuses on what teachers and teacher candidates can do in their classrooms, but there has been much less on MTEs' practice for rehumanizing mathematics. As we engaged in a self-study (Arizona Group, 2005) of our practice, we noted similarities in our approaches to present mathematics as a human activity and parallels in our efforts to rehumanize mathematics for our PSTs. Here, we present a concise personal narrative of our work along three dimensions of Gutierrez's (2018) framework: position/participation, windows/mirrors and cultures/histories.

Naresh: Embracing an ethnomathematics perspective (Mukhopadhyay, Powell, & Frankenstein, 2009) has opened my eyes to a world of mathematics that exists and flourishes outside the rigid boundaries of the academy. From this perspective, I situate my work along the cultures/histories dimension of RM. In my elementary/middle-school math content course, PSTs engaged in a math modeling activity that required them to complete a project emphasizing that mathematics is a human activity. PSTs identified a personally meaningful everyday activity, collaborated with individuals who were insiders to this activity, and reflected on questions such as: What is mathematical thinking? What gets to decide and define what mathematical thinking is? and Who are viewed as experts of knowledge?

Morton: When delving into mirrors/windows dimension of RM, I engage PSTs in a math autobiography activity (Aguirre, Mayfield-Ingram, & Martin, 2013). In a math methods course for elementary PSTs, students tell their mathematical story and recount their in-school and out-of-school mathematics learning experiences. They describe key moments in their mathematics learning that stand out in their memory and expound on what makes those moments memorable. Following this we spend a significant amount of time unpacking those autobiographies to engage in a reflection of their negative and positive experiences learning mathematics and what implications those have for their future practice.

Eddy: I realize that my position and power as a white woman inherently can be a deterrent to Students of Color unless I provide space for them to bring their whole selves to the classroom and be critical of the social and socio-mathematical norms that continue to be perpetuated in a traditional math classroom. The position/participation dimension of RM most resonates with my work and I use *Number Talks* (Parrish & Dominick, 2016; Sun, Baldinger, & Humphreys, 2018) to

create this space and to give PSTs agency in the learning of mathematics. Throughout the math methods course, PSTs led class sessions on number talks, expressed the mathematics from their viewpoint in a way that is inclusive of their culture and community, and reflected on what they saw as worthwhile for sharing with the other PSTs.

A narrative self-study on our teaching practices provides an immersive and transformative learning experience that pushed us to re-envision ways in which we approach mathematics teacher education. A central focus on the practical implications of RM enables us to embrace a more streamlined and rationalized approach to teaching our math content and methods courses.

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Preservice Teacher PCK Gains in a Special-Education Supplemented Methods Course: A Case Study

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The two most common reasons for new teachers leaving the field are challenges with classroom management and incorporating special education students into the general education classroom (Talmor et al., 2005). However, the special education courses offered in most pre-service teacher programs are often general classes taken by all pre-service teachers that leave teachers feeling unprepared for teaching in inclusive classroom settings in their content area (Loreman et al, 2013). Thus, including content-specific special education instruction within the secondary methods course has the potential to better prepare pre-service secondary mathematics teachers for their future inclusive classroom, which could lead to improvements in teacher retention.

Since there is limited special education research at the secondary level specific to mathematics, we decided to use the Response to Intervention (RTI) framework (Fuchs et al., 2003) as a lens

through which to view secondary mathematics education. We used the three-tier model for RTI where tier 1 is general education (80% of students), tier 2 is increased student support (15-18% of students), and tier 3 is special education (3-5% of students). The purpose of this case study was to investigate to what extent including special education instruction within a secondary mathematics content course improved pre-service teachers' pedagogical content knowledge (PCK) in special and mathematics education.

This case study (Yin, 2011) was conducted at a rural research university in the south. The seven participants were preservice secondary teachers in a mathematics methods course where the author was the instructor of record. The goals of this course are to teach instructional techniques for secondary mathematics classes. The pre-service teachers also complete a capstone action research project. Each content area (e.g., algebra, geometry) was introduced first with evidence-based practices for general education students, followed by a discussion of Tier 2 interventions that can be conducted to support students who did not respond to Tier 1 instruction. Students also had a guest lecture from a special education faculty member and did readings on high-leverage Tier 3 practices (McKlesky, 2017) for the general classroom.

Participants completed a pre- and post-test on mathematics and special education pedagogical questions at the beginning and end of the semester. This assessment was developed and validated by a panel of mathematics and special education faculty across several universities. The pre-service teachers' results were compared using a Mann-Whitney test. Additionally, each student was interviewed at the middle and end of the semester on their perceptions of inclusive classrooms and their confidence for teaching secondary mathematics in an inclusive setting.

Seven pre-service teachers took a pre- and post-assessment in Fall 2019. The Mann-Whitney test showed a significant gain in correct answers from the pre-test to the post-test ($p < 0.001$). Six of the participants also consented to be interviewed by the a co-investigator, who had no involvement with the instruction of the class. Five of the seven pre-service teachers reported an increase in confidence in their ability to support students with special education needs in their future classrooms. "I had no idea what an IEP [individualized education program] even was at the beginning of the semester, much less the RTI model that schools are using. I think between the labs we did and the readings we presented to each other, I feel more prepared to help my students," reported one male pre-service teacher about to begin student teaching. All of the pre-service teachers indicated they felt more knowledgeable and confident at the end of the semester.

Overall, the course structure was effective in building pre-service teachers' special education PCK by incorporating an RTI structure into a secondary education methods class. The pre-service teachers seemed to find the RTI structure effective in that it helped clarify the difference between students who need extra support and those who qualify for special education services. They also found readings from selected chapters of Greggory, Kaufeldt, and Mattos (2015) and Sonju, Kramer, Mattos, & Buffum (2019) helpful for teaching strategies best for Tier I and Tier II learners, as these books give evidence-based strategies within an RTI framework. Finally, the pre-service teachers felt more prepared knowing that RTI is the framework local schools use to support all learners. The size of the class is a potential limitation, but early results appear promising.

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