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President's Message

Sarah Smitherman Pratt

I love listening to Brené Brown's podcast while waiting in car line or a school parking lot to pick up a kid from practice. A recent broadcast involved her interviewing James Clear, author of *Atomic Habits*. His premise is that we can build habits with consistency over intensity. Though our society often focuses on success stories and pinnacle moments, we rarely dig into the daily choices and sacrifices made for these successes to happen.

I would like to encourage you that in the work you do, in the ways you pour into others, and in how to strive to make meaningful connections – all of these matter. They may be small actions, but over time they form into memories that will last. You are amazing in all you do, so please, keep taking that next step. You are making a difference.

Specifically, I wish to acknowledge two groups and their dedication and time commitment made by some of our great AMTE-TX leaders. First, our Fall 2021 Conference was a huge success, and I sincerely appreciate the efforts given by the conference steering committee: Dr. Crystal Kalinec-Craig and Dr. Priya Prasad of the University of Texas at San Antonio and Dr. Cody Patterson of Texas State University.

Continued…

What's Inside…

President's Message

Thank you for all of the work you put into making our first (and maybe only?) virtual conference a phenomenal experience. The attendees enjoyed the Moodle site as a way to easily navigate the sessions, the incorporation of Wonder Space to meet informally with others, and the inclusion of a fantastic keynote speaker. Dr. Jennifer Wolfe, Associate Professor of Mathematics Education in The University of Arizona Department of Mathematics, modeled for us how to show care to others while attending to mathematical ideas in her presentation, "Building Caring Communities in Mathematics Teacher Preparation: Learning to Listen and Listening to Learn." Through her talk, we saw how we could foster opportunities to improve our listening, having in-depth conversations, and building communities that welcome all into equitable spaces. Thank you to all who were able to join, and we hope to see you again at our next conference.

Second, thank you to those who have agreed to step in and serve on the AMTE-TX Board and in leadership positions. Please welcome the newest members of our board, Dr. Winifred Mallam, VP of Publications; and Nirmala Naresh; Membership Coordinator. Additionally, we are excited to have Dr. Emma Bullock join the *JMTET* editorial team as Associate Editor. In this role she will work with the other editors and move to become Editor next year. This is the first team enacting our revised editor cycle, and we hope to see this change make an impact for our editors as well as our members.

To wrap up, I wish to offer a reminder for ways to connect with other professionals this year. The 2022 AMTE Annual Meeting will be held in Henderson, Nevada, on February 10-12. We encourage you to seek out fellow Texans and take advantage of this time to meet together. Additionally, our AMTE-TX Annual Business Meeting is scheduled for July 14, 2022 at CAMT in San Antonio, Texas. Registration for CAMT can be found on the web site. Lastly, our 2022 Fall Conference is slated for this August in Corpus Christi! Please look out for details coming soon through email.

As an organization that is now 105 members, let's find ways to continue to make professional connections and influence mathematics education in our great state. Together, we represent a profession that is in need of positivity and encouragement. Take a moment to encourage a colleague, to support a teacher, to share a meaningful conversation with a student. Remember, your actions, though small, can build and lead to something monumental. Let's keep up the consistency and avoid burning out through intensity!

February 22, 2022 falls on a Tuesday. So that Tuesday will be 2-22-22 and we will be able to call it "2's Day!" Knowing that is really whats keeping me going these days.

I would love to hear what you are doing to make a difference. 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 continue spreading joy and hope all year long. I look forward to connecting with you soon!

A Message from the Editors

Dear Colleagues and Friends,

Happy new year! This has been a season of challenges, with the Omicron variant of COVID-19 delaying school openings and casting uncertainty on in-person conferences, and some frightful winter weather canceling class days for some of our schools and universities in Texas. But I have also found it to be a season of joy: I am back to teaching mathematics after working on other projects for a semester; I've been catching up on *Ted Lasso* and building a streak in Wordle; and I'm eagerly looking forward to attending the AMTE Conference in Las Vegas – in person! – after a two-year hiatus.

This is a season of change, too. Our affiliate leadership has worked together to build a more robust process for renewing and sustaining our editorial team. Moving forward, each member of our team will serve a three-year term, rotating through the roles of Copy Editor, Associate Editor, and Editor, each for one year. I am pleased to have the opportunity to introduce our new Associate Editor, Dr. Emma Bullock of Sam Houston State University. Dr. Matt Switzer of Texas Christian University will continue in the role of Copy Editor. Dr. Winifred Mallam of Texas Woman's University has agreed to step into the role of Vice President for Publications for AMTE-TX. We are fortunate to have such talented people committed to take care of our affiliate's journal for the next few years.

We are also fortunate to have some great contributions this season from Texas mathematics teacher educators. We are pleased to present two research reports in this issue: one on opportunities to learn statistics from Anita Sundrani and Travis Weiland of the University of Houston, and one on algebraic reasoning language in teaching from Mehmet Kirmizi of Texas State University. We also have several summaries of 2021 AMTE Conference presentations to share with you; thanks to Dittika Gupta and Suzanne Lindt; Sandi Cooper, Melissa Donham, Kenley Ritter, Michael Warren, Brandy Crowley, Kurt Salisbury, and Melissa Eubank; Karisma Morton and Fardowsa Mahdi; and Juanita Silva, Luz Maldonado Rodríguez, and Dorothy White.

What learning opportunities will 2022 bring? If you are a mathematics teacher educator in Texas, we hope you will help shape the answer to this question! Take a look at our Call for Manuscripts and write about what you have been doing to support mathematics teaching in our state. We can't wait to hear from you. Until then, we hope the coming season brings joy and fulfillment in all that you do.

Best wishes,
Cody Patterson, Editor
Emma Bullock, Associate Editor
Journal of Mathematics Teacher Education in Texas

Opportunities for K–12 Students to Learn Statistics: Implications for MTE in Texas

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Introduction

Individuals today have more access to data and data visualizations than ever before, making statistical literacy a crucial literacy for citizenship. To understand the current landscape of official opportunities to learn (OTL) statistics within Texas schools, we ask the following research question, *what OTL statistics are created by Texas K–12 mathematics standards*? To answer this question, we analyzed current OTL statistics in official Texas standards documents with the aim to use these findings to create recommendations to guide mathematics teacher educators (MTEs) on mathematics teachers' statistical education. Previous studies have provided insights into OTL statistics offered by official state standards, namely that states often place importance on analyzing and interpreting data, while including few OTL how to formulate questions or collect and consider data (Dingman et al., 2013; Newton et al., 2011).

Methods

This work is part of a larger study looking across all states' standards documents (Weiland & Sundrani, under review). We used the recently revised Guidelines for Assessment and Instruction in Statistics Education (GAISE II; Bargagliotti et al., 2020) to guide our analysis of K-12 students' opportunities to learn statistics through the Texas state mathematics standards. The GAISE II is a two-dimensional framework consisting of three developmental levels (A, B, and C) and a four-step statistical investigative process. The three developmental levels are meant to describe the progression from basic statistics skills such as mean, median, mode, and range to more complicated concepts such as confidence intervals. Additionally, the four-step investigative process includes formulating questions, collecting and considering data, analyzing data, and interpreting data. We chose to use the GAISE II as an analytic lens over the original GAISE (Franklin et al., 2007) because the GAISE II elaborates on aspects of the framework and updates examples and language based on recent research. A major difference between the GAISE II and original GAISE framework is the addition of seven highlights meant to address the skills students will need to make sense of and work with data in today's society (see Table 1).

Table 1: Highlights from the GAISE II Report

GAISE II Highlights
1. The importance of asking questions throughout the statistical problem-solving process and how this process remains at the forefront of statistical reasoning for all studies involving data
2. The consideration of different data and variable types, the importance of carefully planning how to collect data or how to consider data to help answer statistical investigative questions, and the process of collecting, cleaning, interrogating, and analyzing the data
3. The inclusion of multivariate thinking throughout all Pre-K–12 educational levels
4. The role of probabilistic thinking in quantifying randomness throughout all levels
5. The recognition that modern statistical practice is intertwined with technology, and the importance of incorporating technology as feasible
6. The enhanced importance of clearly and accurately communicating statistical information
7. The role of assessment at the school level, especially items that measure conceptual understanding and require statistical reasoning involving the statistical problem-solving process

To begin our analysis of the OTL statistics in Texas, we first identified Texas Essential Knowledge and Skills (TEKS) focused on statistical skills and concepts for required mathematics courses in grades K through 12 (i.e., grades K–8, Algebra I, Geometry, and Algebra II). Because statistics concepts are incorporated throughout the TEKS, we drew from the GAISE II to draw boundaries around between what we considered statistics standards. We began by including any TEKS that explicitly stated the words 'data' or 'probability' within the topic or individual standard. Based on the GAISE II, we then excluded some probability standards that only focused on the mathematical aspects of theoretical probabilities. Once the inclusion criteria were set, we used a binary code for each standard to identify the statistical investigative process element(s) the standard referenced, and the developmental level associated with the standard using the GAISE II framework.

Findings and Discussion

Ultimately, we identified 50 standards that made up students' OTL statistics in the TEKS that spanned the required K–12 courses. Within these 50 standards, students had opportunities to engage with the four process elements, and sometimes with multiple process elements within a single standard, with a total of 62 opportunities to engage with one or more of the four process elements. We found that the TEKS were developmentally appropriate, with mostly Level A standards in elementary school, Level B in middle school, and Level C in high school. However, consistent with findings from other studies, Texas statistics standards placed a heavy emphasis on analyzing (65% of standards) and interpreting data (26%) throughout elementary, middle, and high school. There were few opportunities for students to formulate questions (3%) and collect and consider data (6%) Only students in grades 1 and 6 had opportunities to formulate questions and students in grades K, 1, 7, and 8 were asked to collect and consider data. Furthermore, none of the recent updates included in the GAISE II (pp. 8-9) to support changes in the discipline and the inclusion of data science were found in the OTL statistics in the TEKS. Based on these findings, there seems to be a large disconnect between OTL statistics created by Texas state standards documents and those recommended in the original and updated GAISE frameworks. Specifically, there seems to be a need to incorporate more OTL statistics at the high school level overall and more opportunities to engage in all four process elements across all grade levels from K–12.

Recommendations

MTEs can play a pivotal role in meaningfully incorporating OTL statistics in official curriculum by taking part in the standards revision process when Texas revisits the TEKS by using guiding documents like GAISE II during the process. In our larger study we found that the states with OTL statistics most consistent with statistics education research are those that had a statistics educator involved in the revision process. Furthermore, for mathematics teachers to create OTL statistics for their students, it is crucial they have OTL statistics in their teacher education experiences, which means it is necessary for MTEs to create such OTL. Therefore, we offer the following recommendations, based on the GAISE II, to MTEs in creating learning experiences for pre-service and in-service mathematics teachers:

- Incorporate and intertwine all four elements of the statistical investigative process through statistical investigations
- Investigate multivariate data sets and non-traditional variables.
- Create opportunities for teachers to experience the messiness of **real** raw data, so that they can clean, structure, and prepare data for analysis.
- Incorporate technology use to support doing statistics in discipline-appropriate ways.

For mathematics teachers to develop the statistical literacy necessary for citizenship in today's democratic societies it is crucial that MTEs create OTL statistics in the teacher education experiences they provide. We end by encouraging MTEs to read the GAISE II as well as other resources such as the Statistical Education of Teachers (Franklin et al., 2015) and NCTM's Developing Essential Understandings for Statistics 6–8 (Kader & Jacobbe, 2013) and 9–12 (Peck et al., 2013).

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Upcoming Conferences

February 10–12, 2022	26th Annual AMTE Conference	Las Vegas
March 3–5, 2022	RCML Conference	Grapevine, TX
March 16–18, 2022	NCTM Regional Conference	Indianapolis, IN
April 6–9, 2022	Joint Mathematics Meetings	Virtual
July 13–15, 2022	CAMT Conference (AMTE-TX Business Meeting July 14)	San Antonio, TX
September 2022	AMTE-TX Conference	Corpus Christi, TX
September 26–28, 2022	NCSM Annual Conference	Anaheim, CA
Sep 28 – Oct 1, 2022	NCTM Annual Meeting	Los Angeles, CA
November 17–20, 2022	44th PME-NA Conference	Nashville, TN

Upcoming Conferences

ReLaTe-SA: An Effort to Understand Teachers' Reasoning Language in Algebra

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Introduction

I am a doctoral student in mathematics education at Texas State University with eight years of teaching experience at the middle school level in Turkey. I have taught algebra at the middle school level many times and never paid much attention to the language I used as a teacher. I was not aware of the importance of discourse in learning algebra. This spring term, I had a chance to participate in an ongoing research project called *Reasoning Language for Teaching Secondary Algebra* (ReLaTe-SA, NSF Award #1908825). The purpose of this project is to understand teachers' use of reasoning language for teaching concepts and procedures in middle and high school algebra. Previous studies on algebra and algebraic reasoning have investigated other aspects, including students' conceptions and discourse. The link between students' discourse and conceptual understanding has been explored (Chesnais & Constantin, 2020; Reinhardtsen, 2020). However, less is known about middle and high school teachers' language in the algebra classroom. The ReLaTe-SA project investigates the research question: what language do teachers use to describe and explain routines in algebra classes? The goal of this article is to inform readers about some ways we have learned to describe the discourse that teachers use when solving linear equations.

Theoretical Background

We, the ReLaTe-SA team, adopt Sfard's commognitive theory of learning. The word *commognition* is derived from the words "communication"and "cognition." In commognitive theory, cognition is inseparable from communication, and thinking is one's communication with oneself. In this theory, learning mathematics means a change in one's participation in a mathematical discourse (Sfard, 2007). We use the arithmetical discourse profile (Ben-Yehuda, Lavy, Linchevski, & Sfard, 2005) as a framework for describing teachers' algebraic reasoning language. This framework has two dimensions: the subject (author) level, which includes self-referential utterances, and the object level. We focus on the object level, which consists of utterances about mathematical actions such as expressions, operations, numbers, etc. With respect to the specific topic of equation-solving, we mark a line between two types of discourse: *extractive* and *inferential*. In extractive discourse, teachers describe equation solving as an algorithmic sequence of actions on mathematical symbols, whereas in inferential discourse, teachers use properties of numbers and relations to generate a series of inferences about a hypothesized solution to an equation (Ben-Yehuda et al., 2005).

What We Have Learned So Far

ReLaTe-SA is a multi-year project with several data sources. One is the Survey of Algebraic Language and Reasoning (SALR), a survey created for this project that contains 14 open-ended items that represent different situations a teacher might encounter during algebra classes. We collected preliminary data from five mathematics teachers, two of whom teach middle school mathematics and three of whom teach high school mathematics. We investigate teachers' use of words and mediators (symbols used to communicate mathematical objects), routines, and endorsed narratives. Endorsed narratives are statements that are accepted by a discourse

community; narratives may gain endorsement through a process of mathematical inquiry, or by virtue of their relation to narratives endorsed by an authority figure such as a teacher.

To provide an example of how we analyze an item and how this analysis helps us to understand teachers' use of routines in algebra, we share results from a survey item (Figure 1) in which teachers are asked to decide whether students' approaches to solving a linear equation are valid or invalid, and make suggestions about how to change any invalid approach to a valid one. This item is motivated by our interest in how teachers think about routines for solving linear equations. In an extractive discourse, solving a linear equation is usually considered a rigid routine, meaning that it requires a fixed order of steps based on the structure of the equation. In an inferential discourse, solving a linear equation is usually flexible with respect to the use of routines. This item is representative of many of the survey items and was agreed upon by our participating teachers as an authentic representation of a situation they face in their practice.

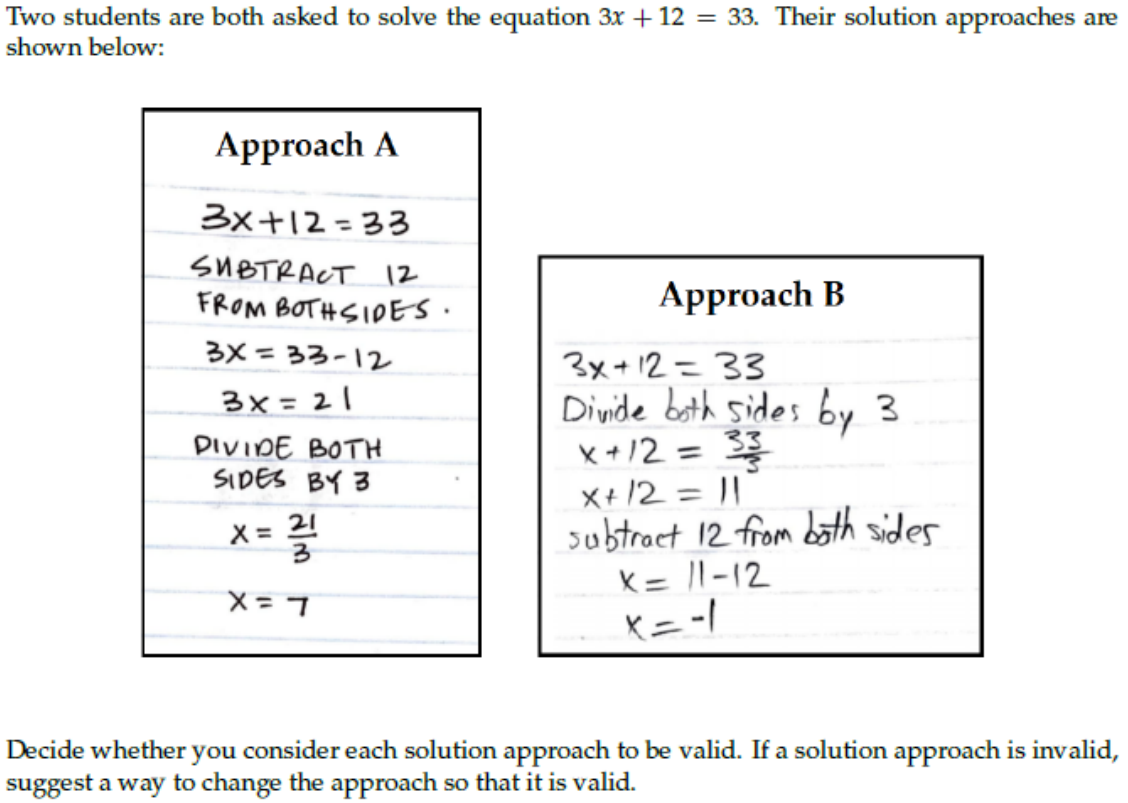

Figure 1. An item with two hypothetical students' solutions to a linear equation.

I used the object dimension of the discourse framework of Ben-Yehuda and colleagues to analyze teachers' discourse with respect to the situation presented in this item. Two out of six teachers explicitly stated that approach B is invalid, and the rest of the participants mentioned that both ways are a valid way to solve a linear equation. However, all participants indicated that there is a procedural error in B. The identification of a specific procedural error suggests that all teachers, including those who stated that approach B is invalid, believed that both ways are *a priori* good options for solving a linear equation. The language that each participant suggest to fix the procedural error in B contains phrases such as "…didn't divide..", "…you could start by dividing 3 but everything…", "… it must be factored from each term…" or something similar. Phrases like these indicate that our participants think the solution of the problem requires some fixed sequence

of steps determined by the structure of the linear equation. Rather than axiomatic and flexible steps with respect to properties of numbers, our participants' narratives contain some elements of extractive discourse.

Conclusion and Next Steps

Understanding teacher discourse is not an easy task; to broaden our understanding, we conduct classroom observations of each participant. Our goal is to design and implement a professional development program that provides opportunities for both researchers and teachers to reflect on how to use reasoning language in teaching conceptual content and discussing students' mathematical thinking. By doing this, we hope to provide many students with robust tools for reasoning in algebra and access to success in algebra.

Acknowledgments

This work is supported by the National Science Foundation through the Discovery Research PreK-12 (DRK-12) program (Award #1908825). Any opinions, findings, and conclusions, or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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Influence of Informal Experiences: Change in Mathematics Teaching Efficacy of Pre-Service Teachers

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Background Information

Self-efficacy explains one's perception of their ability to be successful on a specific task (Bandura, 1986), while teacher self-efficacy explains one's belief of their ability to be an effective teacher (Gibson & Dembo, 1984). Even when preservice teachers (PSTs) gain the content knowledge to teach effectively, many may remain unsure of their ability to effectively deliver the content required of their discipline (Woolfolk Hoy, 2000). In addition, teachers may possess high self-efficacy for a particular discipline, but they may not possess high self-efficacy for teaching it. In mathematics, low mathematics teaching self-efficacy may result from one's own negative beliefs and anxiety about math, which can lead to a decreased belief about their own ability to teach mathematics effectively (Gresham, 2009). Promoting higher teaching self-efficacy is important because teachers with high teacher self-efficacy beliefs are more likely to effectively help students develop conceptual understandings that lead to greater learner success. By developing and implementing inquiry-based lessons, PSTs may be more likely to increase their teacher self-efficacy because of fostering a deeper understanding of the content in mathematics (Richardson & Liang, 2008). Through intensive learning opportunities, such as summer camps, PSTs experience teaching in small groups and facilitate hands-on learning which further fosters PSTs' understanding of student learning and the teaching process (Lindt & Gupta, 2017). Motivated by this argument, researchers explored the impact of facilitating a week-long mathematics camp on PSTs' teacher self-efficacy. The research questions that provided focus to the study were:

1. To what extent do college students' mathematics teacher self-efficacy beliefs change following a week-long mathematics summer camp?
2. How do college students' beliefs and attitudes about teaching mathematics change during a week-long mathematics summer camp?

Results

The poster session presented at AMTE shared an overview and rationale of the research project along with the themes generated through member checking and inter-coder agreement for the impact on PSTs' self-efficacy of teaching mathematics. Results showed that experiencing facilitating mathematics instruction through hands-on activities related to real-life phenomenon helped college students develop their own self-efficacy for teaching mathematics and significantly decreased their mathematics anxiety. The researchers discussed how informal experiences can be instrumental in developing confidence in PSTs' ability to teach mathematics and also positively impacted their own views about core content.

Conclusion and Implications

This research has impact for higher education as it highlights the potential of informal experiences to help PSTs develop confidence and positive self-efficacy for teaching mathematics. Participating in camps helps empower college students to discover and develop their self-efficacy

about teaching and learning in an informal small-group setting. Research indicates that established teachers' expectations regarding their own ability to teach and impact students' learning are less likely to change significantly, but targeting college students' self-efficacy can provide them with more flexible attitudes that are expected to transfer to their future careers (Woolfolk Hoy & Burke Spero, 2005).

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An Intersectional Look at the Math Autobiographies of Preservice Teachers

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Elementary preservice teachers' (PSTs') negative learning experiences with mathematics are the norm rather than the exception (Hembree, 1990). As such, the vast majority of elementary PSTs in the United States carry with them early learning experiences with mathematics that are painful, thus reinforcing the idea that they are not "math people." Though these PSTs may have had similar collective mathematics learning experiences resulting in not developing strong mathematics learner identities, their individual experiences vary according to their intersectional identities (e.g., gendered, racialized, linguistic etc.). These experiences undoubtedly also influence how they view themselves as learners of mathematics and subsequently teachers of mathematics.

Theoretical Background

We draw from intersectionality (Collins, 2019) which, in education, has been used to highlight the nuanced ways that racialized power structures within schools and classrooms have been maintained. The lens of intersectionality allows us to explore if PSTs perceived their math learning experiences in schools as being impacted by their intersecting identities and if so, in what ways.

Methodology

This study took place in the fall semester of 2020 within two elementary mathematics methods courses at a large university in the southwest. We discuss the insights gained from PSTs' mathematics autobiographies (Aguirre et al., 2013). We use responses on the first question, "*How do you feel about math?*" to identify students who expressed a negative attitude towards mathematics. Then, we focus on PSTs' responses to the questions "*What did your teachers do or not do to connect mathematics to your home/cultural/community experiences? How do you think this impacted your experience?*" and "*How do you think your experiences, feelings and beliefs might impact the kind of mathematics teacher that you will be, or the kind of teacher that you want to be*?"

The first step of our research design was to utilize open coding. We limited our pool of PSTs for further analysis by only focusing on those who indicated a negative math affect. Our rationale for this was to gain a deeper understanding of how PSTs talk about those negative experiences and what they attribute them to. This reduced our participant pool down to our six PSTs. Three of our PSTs identified as white and the other three as PSTs of Color.

Findings

We found that all the PSTs expressed that their culture was not included in their mathematics learning experiences. However, the PSTs of Color, unlike their white peers who offered no further explanation of what cultural aspects were missing, further elaborated to discuss the lack of racially relevant content in those experiences and how their math learning experiences could have been enhanced by that inclusion. When exploring PSTs' mathematics teaching aspirations, we found that white PSTs described those future spaces as being fun and caring spaces where students would not struggle the way they did, whereas PSTs of Color described mathematics learning spaces that were inclusive, culturally responsive, and equitable.

Discussion and Conclusion

In our quest towards equity and centering the experiences of those traditionally marginalized in math classrooms, we must attend to the ways in which white women PSTs subscribe to whiteness in the teaching of mathematics by not acknowledging or recognizing its presence within their own learning experiences. Furthermore, among our female PSTs of Color, we must also be mindful of their experiences and provide them with the validation and tools to address some of the racial inequity that they themselves experienced as math learners.

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Teacher Noticing for Preservice Teachers in an Early Childhood Field Experience

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Teacher noticing is the ability of teachers to respond to events in an instructional setting and make sense of what is happening. Sherin, Jacobs, and Philipp (2011) describe teacher noticing as "the process through which teachers manage the blooming, buzzing confusion of sensory data with which they are faced, that is, the ongoing information with which they are presented during instruction" (p. 5). As an essential part of the preparation of mathematics teachers, the Association of Mathematics Teacher Educators' *Standards for Preparing Teachers of Mathematics* (2017) recommend that "Well-prepared beginners commit themselves to noticing, eliciting, and using student thinking." Noticing is an integral part of teaching mathematics and the framework includes the development of attending to children's strategies, interpreting children's understandings, and deciding how to respond (Jacobs, Lamb, & Phillip, 2010).

In response to national attention (NAEYC, 2010) related to a focus on early childhood learning in mathematics, the authors established a summer early mathematics academy to help Pre-K students from low-socioeconomic populations engage in a focused learning experience designed to nurture the development of number concepts. As part of this academy, preservice elementary teachers (PSTs) led instruction for students in this early mathematics academy, and their experiences with the development of teacher noticing was examined as part of an overall study of the academy.

The PSTs involved in the summer mathematics academy were junior teacher education students set to begin their full-year internship in the upcoming school year. These PSTs, guided by a certified, experienced lead teacher, administered small-group mathematics instruction, focusing primarily on number sense, for an entire month. Throughout the process, the PSTs' experiences were documented through interviews, daily logs and reflections, and focus groups. The study was designed to examine how this varied field experience influenced the teacher noticing of PSTs.

In framing the PSTs' teacher noticing, the researchers analyzed video-recorded instructional episodes that included significant mathematical thinking for the PSTs to attend to students' ideas. The researchers identified instructional episodes through observations and PSTs' interactions with students (Sherin, Jacobs, & Phillipp, 2011). The researchers applied the construct of Mathematically Significant Pedagogical Opportunities to Build on Student Thinking (MOST) (Leatham et al., 2015) to explore (1) student mathematics, (2) mathematical point, (3) student thinking, (4) mathematical significance, and (5) PST instructional response or pedagogical opportunity. Researchers used the MOST framework to identify instructional instances in which the PSTs exercised teacher noticing.

In the first iteration of this research, the findings revealed the ways this experience impacted the PSTs. There were changes in how PSTs interpreted student actions and decided what action to take based on these interpretations. The PSTs started to realize how their actions impacted students' learning and understanding and they made more effective in-the-moment decisions. Instead of "telling," the PSTs used questioning to better understand mathematical thinking.

At this time, we have conducted the second iteration of this research, to learn more about "in the moment" noticing, and are engaged in the initial data analysis process. In this iteration, the PSTs had opportunities to "observe" their own teaching (via video) which provided an earlier identification of how their actions influenced student actions. The research team continued to use MOST analysis, but extended the coding to include the ways in which PSTs respond based on teacher moves, using the coding scheme developed by Peterson and colleagues (2017). Results from the PSTs' experiences in this program will help inform the ways the experiences in the academy developed the PSTs' abilities for teacher noticing, and the extent to which they feel prepared to begin their upcoming internship experience.

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Doing Right by Our Preservice Teachers of Color: Reflections by Mathematics Teacher Educators of Color

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In our AMTE 2021 presentation, we called attention to the lack of research on the experiences of preservice teachers of color (PSTCs) in mathematics teacher education programs (Brown, 2014; White et al., 2020). *CAM Up!* (Cultural Awareness in Mathematics Unit Project) is a cross-site research study that seeks to illuminate PSTCs' interests, perspectives, and dispositions toward teaching mathematics to culturally and linguistically diverse student populations. Three institutions serve as research sites: Morgan State University, a historically Black university (HBCU), Texas State University, a Hispanic serving institution (HSI), and the University of Georgia, a predominately White institution (PWI). The presentation was an opportunity to share our ongoing reflections about how we, as mathematics teacher educators of color (MTECs), collectively examine our own cultural identities and deconstruct the ways we teach mathematics methods courses to ensure our PSTCs are better prepared for their future diverse mathematics classrooms.

Ongoing analysis of our data revealed that MTEs cannot make assumptions about how prepared PSTCs are to counter deficit narratives and stereotypes about historically marginalized students in their future classrooms. We discovered that PSTCs have racialized mathematics learning

experiences (Martin, 2019) yet seemed unaware of the stereotypes they held about students who shared cultural ties with them and those who did not. For example, an Asian PSTC claimed to be an English language learner (ELL) but not one of "those" ELLs who struggled with English in school. Or the Black PSTC, who lamented the lack of family focus in Black families. These comments helped us realize that PSTCs need opportunities to discuss other examples of internalized racism (Huber et al., 2006; Kohli, 2021) and understand how their own biases and experiences may impact their future classrooms.

As MTECs our conversations included deconstructing our own racialized mathematics learning experiences and cultural identities. For example, we began by creating and sharing our own culture tool list—listing the characteristics we identify as part of our culture—a task we used with our PSTCs. This drove us to have discussions among ourselves and with other MTEs to challenge and deconstruct and deepen our own understanding of culture and mathematics. For example, we gained insight into the deficit narrative that exists around emergent bilingual students and their perceived lack of English language (i.e., the overemphasis on teaching math vocabulary before content), and navigated the transition from viewing language as a barrier to language as a resource. In doing this, we began to rethink our interpretations of PSTCs' perspectives and the tools they need to critically challenge the inequities in their P–16 learning experiences.

Our goal for the AMTE session was to invite attendees into a rich and open dialogue about some of the challenges MTECs encounter when preparing PSTCs to teach mathematics to historically marginalized student populations. We agreed that conversations about mathematics and culture can no longer be stand-alone discussions or once-a-semester topics. These conversations need to be infused throughout methods and content courses and ideally lead to broader systematic conversations among teacher education faculty. We ended the session by inviting the attendees to reflect upon these questions: (a) How are MTECs and PSTCs positioned in your teacher education program?, and (b) How does culture impact the faculty and students in your teacher education program and their perceptions of mathematics?

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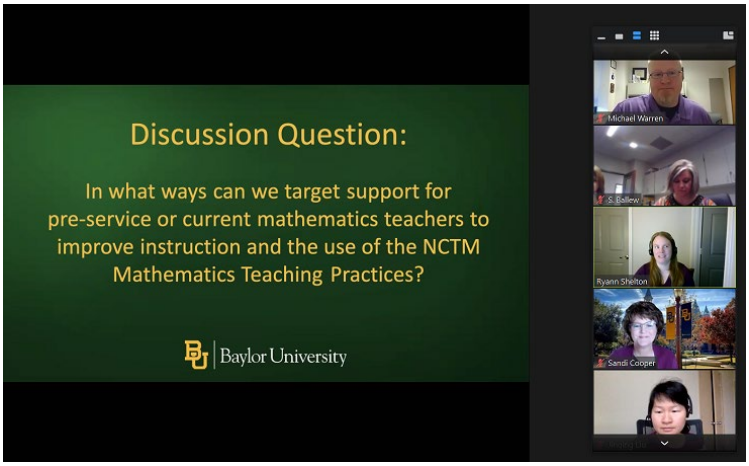

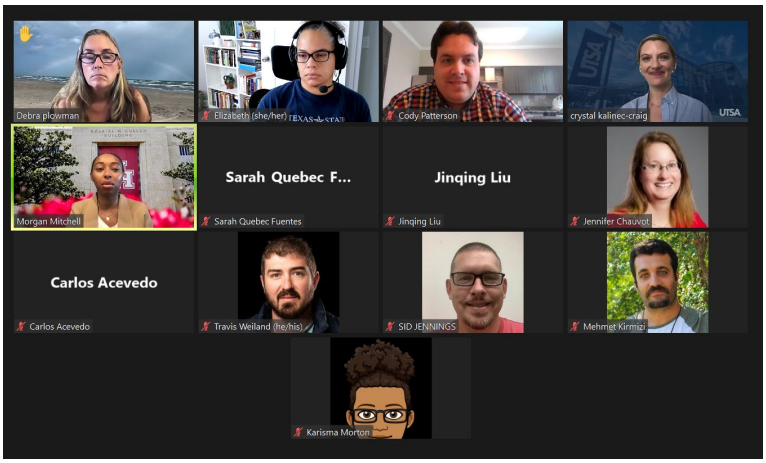

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