



Mathematics Teacher Educators Focusing on Equity: Potential Challenges and Resolutions

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Teacher education is critical in preparing teachers to implement equitable instructional practices and thus contributes to improving educational and social conditions for underserved children and youths (Jacobsen, Mistele, & Srirman, 2012; Zeichner, 2009). Although the preparation of teachers to work with diverse student populations has been the subject of a growing body of research (e.g., Cochran-Smith, Fieman-Nemser, McIntyre, & Demers, 2008; Cochran-Smith & Zeichner, 2005), few studies to date have explored conditions under which mathematics teacher educators (MTEs) can help teachers¹ develop equitable mathematics pedagogy (McLeman & Vomvoridi-Ivanovic, 2012; Strutchens et al., 2012).

Although this literature illuminates important instructional practices of MTEs who teach through an equity lens, a systematic and broad-scale examination of these practices, including potential challenges, could inform mathematics teacher education by unpacking commonalities and differences in ways that MTEs address equity in their courses. Furthermore, by gaining insight into possible patterns regarding different resolution strategies, the field can begin to develop structures to prepare and support teacher educators who choose to make equity a priority in their practice.

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Mathematics Teacher Educators Focusing on Equity

In this article, we discuss findings from a qualitative study of 23 MTEs who self-reported challenges and resolutions they encountered when teaching mathematics methods courses with a focus on equity. Our research questions are as follows:

1. What challenges do MTEs who make equity a priority in their instructional practice face when teaching mathematics methods courses?
2. How do these MTEs work toward resolving these challenges?

In what follows, we overview relevant literature regarding conceptions of equity, challenges MTEs face as they teach through a lens of equity, and some resolution strategies. We then describe our study's conceptual framework, methodology, and findings. We conclude by discussing our findings and implications for practice and future research, framing both in ways relevant to teacher educators of all disciplines, while highlighting unique components to mathematics teacher education as appropriate.

Equity in Teacher Education

Conceptions of Equity

Nieto (2010) built on earlier conceptions of equity (Banks & Banks, 1995; Ladson-Billings, 1995) and argued that teacher educators can alter the inequities in U.S. schools by inviting teacher education students to critically analyze why and how schools are unjust for some students. This analysis, Villegas (2007) pointed out, will prepare teachers to help all students “participate equitably in the economic and political life of [a] country” (p. 372). Although some researchers (e.g., Butin, 2007) have argued that the concept of social justice is not well defined, *democratic participation* is one of the core principles of equity within teacher education across the globe, with researchers documenting its use in such places as Japan (Gordon, 2006) and England and South Africa (Harber & Serf, 2006).

Equitable education is also viewed through the lens of *access*, meaning all students have equal opportunities to study and learn (Flores, 2007; Murphy & Hallinger, 1989). This notion of equity is common in mathematics teacher education, with organizations such as the National Council of Teachers of Mathematics (2000) making access a cornerstone of their equity principles, suggesting that “all students, regardless of their personal characteristics, backgrounds, or physical challenges, must have *opportunities* to study—and support to learn—mathematics” (emphasis added). However, despite acknowledging the importance of access as a component of equity, some MTEs have argued that viewing equity solely through this lens supports deficit models of thinking because access focuses on what students lack relative to a normalized majority (e.g., Gutiérrez, 2008).

Gutstein et al. (2005) proposed that having multiple presentations of equity is not necessarily problematic, because they serve specific and sometimes different

purposes. In the context of teacher education, equity means providing opportunities and support for teachers to learn rich content that focuses on meaning making, fosters and empowers decision making, and critiques and transforms injustices (Aguirre, 2009). Similarly, Gutstein (2006) suggested that equitable teaching should position teachers to “examine [their] own lives and other’s [sic] lives in relationship to sociopolitical and cultural-historical contexts” (p. 5). Furman and Shields (2005) cautioned, though, that equity is a process and an ideal construct that may never be fully realized.

Challenges and Resolutions

The challenges MTEs face when attempting to engage preservice teachers (PSTs) around issues of equity are well documented and often consistent with those that other teacher educators face. One major challenge is resistance (e.g., Aguirre, 2009; Ensign, 2005; Gillespie, Ashbaugh, & DeFiore, 2002; Han et al., 2014; Herbel-Eisenmann et al., 2013; Landsman, 2011; Rodriguez, 1998). Han et al. (2014), for example, noted that PSTs can resist the discussion of issues related to race or power if they perceive an instructor has an “agenda,” especially if the instructor is not a member of the dominant culture. Furthermore, Herbel-Eisenmann et al. (2013) have discussed how PSTs from the dominant culture can exercise passive resistance by simply agreeing with their instructors about issues of equity, making it challenging to engage PSTs deeply with these issues.

Aguirre (2009), Han et al. (2014), and Kitchen (2005) have provided valuable insight into the power of building positive relationships as a means to resolve challenges regarding resistance. Kitchen (2005), for example, begins each semester sharing his personal narrative. This practice helps build meaningful relationships within a respectful and trusting community of learners. However, institutional barriers, such as traditional course structures in higher education, do not allow teacher educators sufficient time and space to build meaningful relationships with students to enable difficult issues to be discussed in important ways (Han et al., 2014). Systematic program development and collaborative planning across courses has helped teacher educators work toward overcoming institutional barriers (Han et al., 2014), but such work is often difficult to accomplish when few institutional colleagues share the mission of incorporating equity in teacher education (Ladson-Billings, 2005). Nevertheless, Han et al. suggested that belonging to professional organizations, making “critical friends,” and engaging in scholarship might also serve as avenues to build competency in incorporating equity in instruction.

Although some challenges are similar across all disciplines, MTEs also face unique and subject specific challenges. For example, PSTs may perceive mathematics as not “real” if the mathematics does not match their prior educational experiences (Ensign, 2005). Many times these prior experiences focused on procedural fluency (Guillaume & Kirtman, 2010), with mathematical concepts and teaching viewed as

politically neutral (Felton, 2010; Gutstein & Peterson, 2005). Additionally, some MTEs (e.g., Aguirre, 2009; Bartell, 2011; Gutiérrez, 2009) have discussed the challenge of teaching with an acceptable balance of mathematical concepts and nonmathematical concepts. Although these MTEs have not offered specific suggestions for resolving these challenges, Gutiérrez (2009) suggested that instructors should embrace the tension of “teaching mathematics and not teaching mathematics” because “it is in embracing the tension (not choosing between the two) that allows teachers to develop their own authentic practices and political clarity around issues of equity” (p. 14).

Conceptual Framework

For this study, we framed each challenge and resolution as having two components: a locus and a nature. Locus refers to the *source* of the challenge or resolution; nature refers to the *characteristics* that are necessary for the challenges and resolutions to hold meaning. Both the locus and nature can be either external or internal to an individual, where internal is dependent on the motivation or actions of an individual.

We believe PSTs must develop certain processes to teach mathematics through a lens of equity; while developing or facilitating classroom activities, MTEs might support PSTs to acquire knowledge, scrutinize their beliefs and emotions, and develop interpersonal communication. Therefore, to understand the nature of internal challenges and resolutions, we developed a framework that focuses on the cognitive, affective, and social domains of learning. The *cognitive domain* focuses on intellectual skills through the acquisition of different forms of knowledge: factual, conceptual, procedural, and metacognitive. Within these different dimensions of knowledge, individuals come to know the specifics of a discipline, including terminology; how basic elements are intertwined within a larger structure; discipline-specific skills and algorithms; and appropriate contextual, conditional, and self-knowledge (Krathwohl, 2002). For example, the development of specific forms of knowledge through reading about theories of learning is a cognitive aspect of learning. The affective domain represents the emotional processes within learning, including beliefs, values, motivations, attitudes, dispositions, and a willingness to participate (Jagger, 2013). For example, grappling with beliefs about particular learners is of an affective nature. The social domain concerns the interpersonal functions necessary in public environments, such as communicating, participating, negotiating, and collaborating (Dettner, 2006), all of which are central to the development of equitable teaching practices.

In no way were we interested in classifying participants’ statements in a hierarchical manner, as is so often associated with these domains. Instead, we sought only to discern if there was a pattern to the challenges some MTEs face while making equity a focus of their work. Likewise, our goal was similar with the resolutions

the participants shared—what patterns could we uncover regarding participants’ resolution strategies?

Methods

The purpose of this qualitative study was to generate understandings across MTEs’ self-reports about the challenges they encountered and the resolutions they implemented when teaching mathematics methods courses through a lens of equity.

Participant Recruitment and Selection

We identified and contacted university-based MTEs who make equity a priority in their work by searching for MTEs with at least one equity-related publication and/or presentation at an Association of Mathematics Teacher Educators conference within the last decade. We also searched for MTEs who had worked at National Science Foundation–funded Centers of Learning and Teaching that focused on equity in mathematics education.

Data Collection

Based on our search, we sent an e-mail to 80 MTEs and invited them to participate in an online survey if they currently were teaching or had at some point taught a mathematics methods course. Twenty-three MTEs completed the survey, which asked them to upload a current methods course syllabus and respond to the following four prompts:

1. Please describe what concept of equity guides your instructional practice.
2. Please describe how you address equity in your class that is not reflected in your course syllabus.
3. Please describe the top 3 or 4 challenges/tensions you face as you incorporate issues of equity in your methods course.
4. For the challenges/tensions you described above, what are some of the steps you take to resolve them?

Data Analysis

Using a constant comparative method (Glaser & Strauss, 1967), we first used open coding to look for broad themes and categories. We compared our themes and categories and jointly analyzed our participants’ survey responses regarding their conceptualizations of equity. Next we coded the types of challenges and the ways participants resolved these challenges by considering each response as a collection of separate statements comprising a list of challenges and resolutions from that

Mathematics Teacher Educators Focusing on Equity

participant. Finally, we analyzed the challenges to identify the locus of each. We did not, however, analyze the resolutions for a locus, assuming that the source of the resolution would be the participants themselves. A comparison of codes showed a 92% agreement. All discrepancies were resolved through consensus.

We then utilized the domains of learning specified in our conceptual framework (i.e., cognitive, affective, social) to code for the nature of the challenges and resolutions considered internal to a specific individual. Statements that focused on the acquisition of knowledge about equity issues, such as “students have limited knowledge . . . to engage in these conversations” (Participant 12), were coded as *cognitive*. Statements focused on emotions related to issues of equity were coded as *affective* and included statements such as “prospective teachers often feel uncomfortable and/or incompetent about the idea of teaching mathematics for understanding” (Participant 4). Challenges that described the interactions between and among individuals, such as the statement “particular students dominate class discussions” (Participant 5), were coded as *social*. A comparison of these codes showed an 81% agreement. All discrepancies were again resolved through consensus.

Findings

In this section, we first detail how participants conceptualized equity. We then present findings related to the participants’ major challenges while focusing on equity within a mathematics methods course as well as MTEs’ primary resolution strategies.

Conceptions of Equity

Participants’ responses to the first survey prompt showed they had varied and, at times, multiple views of equity. This lends credence to our sample being representative of MTEs who have published or presented scholarly work on equity within teacher preparation. Specifically, 10 of the 23 participants shared more than one conception of equity that guides their practice, which resulted in 40 distinct statements. Nearly half of these statements (17 out of 40) indicated that equity must provide all students access to high-quality mathematics instruction and resources. As Participant 13 noted, equitable mathematics instruction utilizes “instructional strategies that allow for all to participate.” The remaining 23 statements showcased a range of viewpoints, though a few MTEs noted that they prefer the term *social justice* rather than *equity*. Their vision is for students to learn to “use mathematics to understand, analyze, critique, and address issues of social justice” (Participant 4).

Challenges

Participants identified the top three or four challenges or tensions they face as they incorporate issues of equity within their mathematics methods courses. From the 23 participants, 75 separate challenges were identified.

The loci of challenges. The loci of the 75 challenges were characterized into three main categories: (a) 29 focused on a challenge involving PST(s), (b) 21 focused on a challenge within an MTE, and (c) 25 were external to an individual and focused on issues within society.

Challenges related to PSTs. PSTs' *willingness* or *ability level* to attend to issues of equity within mathematics and the lack of a *critical lens* through which PSTs discuss issues of equity were the top challenges noted (18 of 29 statements). Some participants noted how PSTs are not comfortable "openly discussing issues of equity" (Participant 10), while others shared that some PSTs "have never [before] experienced [this] kind of pedagogy" (Participant 4) in a mathematics class, having perhaps focused more on procedures and facts rather than critiquing real-world scenarios. This lack of critical thought by PSTs morphs into a challenge for MTEs as it becomes hard to engage PSTs with "the complexity of thinking about and teaching for equity and social justice" and can lead to "overly critical perspectives [that] might serve to shut down efforts (i.e., this is so hard, so we just won't bother doing it)" (Participant 9).

Challenges internal to MTEs. There were 21 challenges whose locus was identified as internal to MTEs, 16 of which were specific to instructional practice. Whereas some participants noted being challenged by PSTs' lack of critical thought, others were challenged by their own thinking regarding issues of equity. One participant noted a challenge related to "[the MTE's] own confidence/knowledge in presenting issues of equity," further explaining that "at times when students raise important counterpoints to a given topic, sometimes I am at a loss for what to say" (Participant 6). Participants also shared difficulties in providing experiences to engage PSTs with equity. Consider the following statements:

- "Providing PSTs with real classroom examples of equitable math teaching and teaching math for social justice" (Participant 7).
- "Creating concrete experiences that allow teachers to reflect in-depth issues of equity" (Participant 15).

Both of these statements show how MTEs struggle with something internal to their own practice: What can they as instructors do to create or provide what is needed by PSTs to fully engage with equity-related issues?

Challenges related to society. The remaining 25 challenges were ones with a locus within society at large and not internal to any one individual. Of these, 12 focused on the lack of time in a given class, semester, or program. For example, Participant 11 shared that "students cannot develop the knowledge and competencies they need in 1 semester." The locus here is external, because these participants were speaking to time limitations based on programmatic structure as opposed to internal struggles with time (e.g., time management). Participants also expressed

Mathematics Teacher Educators Focusing on Equity

challenges regarding the *realities of schooling*, such as “high stakes accountability and scripted curriculum” (Participant 7) and “the way this (reality) positions teachers and students” (Participant 2).

Nature of the challenges. For the challenges whose locus was internal to a PST or an MTE, we applied our conceptual framework by determining whether the challenge was of a cognitive, affective, or social nature (see Table 1).

Nature of PST challenges. Of the 29 statements focused on PSTs, 18 were of an affective nature. For example, Participant 17 reported that “not all students are convinced that equity is a primary goal,” whereas Participant 4 shared, “Prospective teachers often enter my class thinking of mathematics as ‘neutral,’ ‘culture-free,’ ‘language-free,’ ‘values-free,’ etc.” As these statements demonstrate, beliefs about the relevance of issues of equity to mathematics teaching and learning are a shared property among some challenges faced by our participants. For Participant 1, this belief manifested in a challenge where “prospective teachers . . . see issues of language as only being relevant to English learners.” Because PSTs tend to see issues of equity as not applicable to all students, Participant 1’s comment elucidates how PSTs may not see the relevance of language issues in a mathematics methods course.

Of the remaining 11 statements, 3 were cognitive and 4 were social. The cognitive statements focused on the type of knowledge possessed by PSTs, such as how PSTs interpret the word *language*: “Prospective teachers . . . interpret ‘language’ or ‘register’ to mean mainly vocabulary” (Participant 1). The challenge here is that PSTs have a simplistic notion of mathematical language and therefore do not understand the language demands that are present in mathematics classrooms. Statements of a social nature focused on how PSTs demonstrate engagement in class, such as “particular students defer to other students’ ideas during class discussions” (Participant 5). Here the challenge is that, in social situations, PSTs do not assert their own views or opinions when discussing issues of equity.

Table 1
Nature of Challenges Related to Preservice Teachers
and Mathematics Teacher Educators

<i>Nature</i>	<i>Locus, no. (%)</i>	
	<i>PST</i>	<i>MTE</i>
Cognitive	3 (10)	11 (52)
Affective	18 (62)	5 (24)
Social	4 (14)	3 (14)
Unable to determine	4 (14)	2 (10)
Total	29 (100)	21 (100)

Note. MTE = mathematics teacher educator; PST = preservice teacher.

Nature of MTE challenges. Although the challenges involving PSTs primarily captured elements within the affective domain of learning, the majority of the challenges associated with MTEs were of a cognitive nature. For example, one participant noted that a challenge is one's "own . . . knowledge in presenting issues of equity" (Participant 6), that is, one's own level of cognition in terms of knowledge needed to discuss issues of equity within a mathematical context. Participants also found developing specific activities for the methods class a challenge. As Participant 23 noted, "It can be a challenge to select materials that PSTs will understand and make sure that math goals are met as well," suggesting that it can be cognitively challenging to select materials to help PSTs develop understandings of both equity and mathematical concepts.

Affective challenges dealt with value-laden issues, such as a participants' beliefs and assumptions, for example, "it is hard to have other perspectives surface without making assumptions about my preservice teachers" (Participant 9). Challenges of a social nature were ones that detailed participants' interactions with individuals as sometimes being "too raw in discussing the needs of diverse learners" so that PSTs become "intimidated and even fearful of teaching diverse populations" (Participant 8). The challenge for this participant seems to be how best to approach discussions about issues of equity so that PSTs are encouraged, rather than discouraged, about teaching diverse student populations.

Nature of external challenges. The overwhelming majority (23 out of 25 statements) of challenges external to a particular individual were ones associated with participants' programs, institutions, or society in general and are thus of a *structural* nature. Several participants, including Participant 21, who noted the challenge of "[going] against the dominant traffic pattern," expressed challenges in intentionally going against many societal norms, such as possibly combating the notion that mathematics content and teaching are context free. Helping PSTs develop an understanding of how they can work against normalized structures that do not represent equitable practice in mathematics is intensified when PSTs are in field placements that "despite their [the MTE's] best efforts, reinforce stereotypes that our student-teachers may already have and make it actually harder to demonstrate ways to teach mathematics equitably" (Participant 22).

Participants also noted that mathematics teacher education programs are not structured in ways that allow for authentic discussions around equity to take place in the depth and to the extent needed, as expressed in the following comment:

Issues of diversity are uncomfortable to discuss, and having enough time throughout the semester to talk about instances of racism or sexism, for example, in a safe space, proves difficult. By enough time, I mean it takes a great deal of trust, in my opinion, to gain access to the deep places where we all hold racist and sexist beliefs, for example. A 3-hour course meeting once a week with multiple topics to cover does not always allow the time and consistency to have those authentic conversations. (Participant 22)

Mathematics Teacher Educators Focusing on Equity

Because the methods course is most likely alone in addressing issues related to equity, several participants believed that attention to these concerns within their program was insufficient. As Participant 17 expressed, “Some students have commented that they wish they had learned some of these ideas in other classes,” whereas Participant 20 wrote, “In reality, every class that our students take ought to address the inequities we see in schools.” These comments speak to programmatic issues many MTEs face that make it challenging or even impossible to address issues of equity meaningfully in teacher education.

Resolutions

The 23 participants identified 57 distinct resolutions.

Loci of resolutions. As noted earlier, the locus of every resolution was assumed to be the participants (MTEs) themselves. The majority of resolutions referred to the use of specific instructional strategies, specifically counternarratives through mediums such as data, readings, and videos to contradict normalized narratives. For example, Participant 1 uses “LOTS of video of young learners and adolescents doing math” to counter the idea that specific children cannot engage in mathematics in particular ways. Participants also resolved some challenges by working to better themselves as educators, such as joining “professional development groups within the university that can support my teaching” (Participant 15).

Nature of the resolutions. As with the challenges, the nature of the resolutions was examined, and as seen in Table 2, the relative majority of statements (27 of 57) were of a social nature. In other words, many participants resolved their challenges through social interactions, as seen in the following statements:

- “I make a huge effort to encourage diverse students to make contributions to class discussions” (Participant 5).
- “[I] try to work with some of the other methods instructors/program[s] to make equity at the forefront of the PST preparation” (Participant 17).

Table 2
Nature of Participants’ Resolutions to Challenges

<i>Nature</i>	<i>Resolutions, no. (%)</i>
Cognitive	14 (24.5)
Affective	6 (11)
Social	27 (47)
Unable to determine	10 (17.5)
Structural	0 (0)
Total	57 (100)

- “My PTs are encouraged to challenge my and others’ viewpoints in a respectful manner” (Participant 23).

Each statement shows how participants utilize social interactions as mechanisms to resolve challenges, specifically by encouraging dialogue around issues of equity.

Resolutions of a cognitive nature illustrate participants’ efforts to become more knowledgeable by, for example, “reading and getting resources from other instructors” (Participant 15). Statements of a cognitive nature also illustrate participants’ attempts to help PSTs become more knowledgeable about issues related to equity in teaching and learning mathematics, by, for example, using “data to convince [PSTs that] these students are at risk” (Participant 8) or by drawing PSTs’ “attention to the mathematical and statistical literacies needed to understand current events” (Participant 2).

Resolutions of an affective nature predominantly focused on two ideas. The first was about how to begin discussions regarding issues of equity. Participant 10 noted that it is helpful to begin “with less controversial issues (e.g., math ability) as a springboard to more difficult topics,” in acknowledgment of PSTs’ emerging beliefs, attitudes, or values. The second idea involved the use of instructional strategies that challenge the lens in which PSTs view the world. Participant 7 phrased this resolution strategy as “[putting PSTs] in the shoes of the other.”

Comparison of Nature of Challenges and Resolutions

There seems to be a mismatch between the nature of participants’ challenges and the nature of their resolutions (see Table 3). Specifically, the majority of the challenges were of an affective or structural nature, whereas the majority of the resolutions were of a social one.

Participants were not asked to pair challenges with resolutions, so it was not possible to determine specific patterns of action, such as whether challenges related to PSTs’ lack of critical thought were resolved through discussions or readings. However, the number of structural resolutions makes sense given that the structural challenges noted seem to lie beyond the influence of the instructor (e.g., having more time to teach).

Table 3
Comparison of the Nature of Challenges and Resolutions

<i>Nature</i>	<i>Challenges, no. (%)</i>	<i>Resolutions, no. (%)</i>
Cognitive	14 (19)	14 (24.5)
Affective	23 (31)	6 (11)
Social	7 (9)	27 (47)
Structural	23 (31)	0 (0)
Unable to determine	8 (11)	10 (17.5)
Total	75 (100)	57 (100)

Discussion

This study provided a space for MTEs to consider the challenges they face and the ways in which they resolve challenges as they focus on equity within their own practice. The following sections contextualize these self-reported challenges and resolutions using prior research and provide some possible interpretations for patterns that emerged from the data.

Loci of Challenges

The MTEs who participated in this study have all published or presented scholarly work on helping teachers develop equitable mathematics pedagogy. They have all thought at length about equity, in both their instructional practice and their scholarly work. They also all acknowledge how much more there is to learn, suggesting how challenging it is to learn to teach equity to and for PSTs. As a consequence, the loci identified in this study and the breakdown of the specific challenges within each locus category demonstrated a strong correlation to those identified in other studies (e.g., Aguirre, 2009; Herbel-Eisenmann et al., 2013).

Across the data, MTEs only identified internal loci (i.e., themselves or their PSTs); no other specific individuals, such as a department chair or other administrator, challenged the MTEs' beliefs toward the importance of focusing on equity within a mathematics methods course. This lack of focus on other individuals may be due to any number of reasons. It is possible that such a challenge does not exist or is not a top challenge for these MTEs. Perhaps, though, the MTEs are isolated in their teaching, with a department chair not knowing what occurs in the MTE's practice unless a PST complains. Alternatively, it is possible that MTEs generalized the challenge to an institutional or programmatic one instead of targeting one individual, making it easier for the MTEs to conceptualize their challenges based on their position within a power relationship—either themselves as the person with the power (as the instructor of a class) or as the ones powerless (when they answer to higher authorities and/or policies and procedures). When reality demonstrates a lack of power in a relationship, it might be easier for an individual to ascribe a challenge to a broader structure, again speaking to the possible solitude and isolation of MTEs in their instructional practice.

Nature of Challenges

That a majority of PST challenges are associated with the affective learning domain is consistent with the focus on the examination of PSTs' beliefs and attitudes in teacher education literature, including mathematics teacher education. Indeed, beliefs and attitudes are such prominent areas of study in mathematics education that an entire chapter in the most recent compilation of research on mathematics teaching and learning is focused on this topic (Philipp, 2007). For teacher educators,

in particular, ones who focus on equity, beliefs and related constructs are essential to consider. Raymond (1997) found that teacher education programs are more likely to influence a teacher's beliefs rather than directly impacting the specific strategies and instructional moves a teacher enacts in the classroom.

Likewise, that a majority of challenges with the locus internal to MTEs were of a cognitive nature is also consistent with previously reported literature. As Furman and Shields (2005) noted, equity is a process working toward an ideal state. Thus, as MTEs learn more, they realize they need to learn even more. Additionally, teacher educators who make equity a priority in their practice assumedly have already grappled with their beliefs and values regarding this work, and as such, beliefs and values would not constitute challenges for them.

Nature of Resolutions

Although the challenges external to MTEs were all structural in nature, there were no structural resolutions noted. Instead, the majority of the resolutions were of a social nature. Perhaps MTEs feel that grassroots movements that lead to social action (e.g., to seek out colleagues within the institution to interact with around these concepts) must occur before programmatic or systemic changes will. There may also be a perception that structural challenges do not have a long-term resolution in the foreseeable future so that MTEs may be finding ways to navigate creatively within these structures or, as Gutiérrez (2013) framed it, "find[ing] loopholes in policies or interpret[ing] rules and/or procedures in ways that allow them to advocate for historically underserved and/or marginalized students" (p. 14).

Comparison of the Nature of Challenges and Resolutions

In this study, a majority of the resolutions were of a social nature, even though the majority of the challenges were not. This difference in focus is an important consideration when helping PSTs develop pedagogical theories and strategies focused on equity. Our participants, and perhaps teacher educators in general, may see learning as a social endeavor (Vygotsky, 1978) and therefore tend to resolve affective challenges through social interactions. However, Brophy (1999) argued that a match must exist between a learner's perception of self and that of the learning opportunities. In other words, the PSTs need to see the relevance of an authentic learning opportunity to their own personal agendas. To do so, they need to develop

relatively elaborated schemas that include motivational as well as cognitive components before they can engage in abstract and complex learning activities with appreciation . . . and can experience some of the satisfaction or other intrinsic reward potential that the learning opportunity offers. (p. 81)

For PSTs who are learning to develop equitable pedagogy, focused attention on the development of productive insights, values, and dispositions regarding equitable

Mathematics Teacher Educators Focusing on Equity

pedagogy is necessary to appreciate other, more complex activities, including ones social in nature. When PSTs are grappling with their beliefs and values about teaching mathematics through a lens of equity, and especially considering that many believe that mathematics is neutral or culture-free (Felton, 2010; Gutstein & Peterson, 2005), it is possible that they will not be able to appreciate the nuanced features of using students' thinking as a way to empower their students to be agents of change.

Additionally, PSTs may see (either consciously or subconsciously) the activities that are focused on more cognitive and social components as ways to avoid dealing with their beliefs or values and instead will focus on other components of the activities. Thus having resolutions that are social or cognitive in nature to combat challenges that are affective in nature may not have the desired effect.

Implications

The MTEs in our study have been active in bringing issues of equity to the forefront of mathematics teacher preparation, specifically within mathematics methods course work. As our findings show, these MTEs have varied and, at times, multiple conceptions of equity. This is an important consideration, as there may be other teacher educators who desire to teach with such a focus yet may feel that their notion(s) of equity are incorrect or incomplete. Even some of the MTEs in our study, who have expertise in this area, felt they did not know enough about issues of equity. As reflected in our findings and in the literature, there is not one way to conceive of equity. Thus those who are new to this work should embrace the complex, varying, and evolving definitions of equity while moving forward to make equity a priority in their instructional practice. Further consideration should be given to how teacher educators, in particular, MTEs, are prepared to do this work in doctoral programs to build capacity in this area (Taylor & Kitchen, 2008).

As our findings show, it is a challenge to help PSTs develop productive insights, values, dispositions, and so on, regarding equitable pedagogy. Yet many of the resolutions are focused on the social domain, not the affective. It may be beneficial to engage PSTs in ways that target the affective domain, such as Brady's (2005) use of contemplative pedagogy as a way for students to center themselves and become in tune with their feelings and emotions. For teacher education, contemplative pedagogy offers a path to challenge PSTs' apathy and resistance by helping them to become mindful toward their beliefs regarding issues of access, advocacy, democratic participation, and other equity-related topics.

Despite recommendations that equity should be integrated throughout teacher education programs (e.g., Zeichner, 2009), our findings demonstrate this is not yet occurring. Specifically, our participants noted a lack of time to work with PSTs, a crucial factor in helping PSTs develop a rich and nuanced framing of equitable pedagogy. For MTEs, this means helping PSTs understand that mathematics teach-

ing is not neutral and free from context (Felton, 2010; Gutstein & Peterson, 2005) and, as such, that equity is not taught divorced from content.

Although making programmatic changes (e.g., increasing the number of required credit hours) may be difficult due to state or university mandates, it is imperative to enhance communication and the development of relationships across programs in ways that value the contributions and expertise of different faculty (Musanti, Marshall, Ceballos, & Celdón-Pattichis, 2011). This enhanced communication must focus on developing genuine and shared understandings (Musanti et al., 2011) and common language about how to model, as well as help PSTs develop, equitable pedagogy. For example, MTEs and mathematicians might come together to learn from each other about how mathematics can be taught in ways that put decision making and the critiquing and transforming of injustices at the forefront of learning mathematics (Aguirre, 2009).

Undertaking this focus on equity needs support. At the institutional level, teacher educators need support from administrators to ensure that this work is valued within a teacher educator's workload. Across institutions, teacher educators need to share more resources that can be used within courses, including examples from expert teachers who integrate equity within their practice (e.g., Quintos, Civil, & Torres, 2011). Finally, more efforts from individual institutions that have transformed and enhanced programs of teacher preparation, such as those described by Brisk (2008) and Darling-Hammond (2006), should be disseminated.

Directions for Future Research

To gain a thorough understanding of the challenges faced by MTEs who teach through a lens of equity and how they resolve various challenges to such a stance, an in-depth examination of these MTEs' instructional practices is warranted. In addition, studies that consider MTEs' characteristics (e.g. seniority status; gender, race, cultural, and/or linguistic backgrounds; geographic locations; institutional focus [research intensive vs. teaching]) and how those characteristics may pose different challenges and resolution strategies are needed. Future studies might also consider similarities and differences in the challenges and resolutions faced by teacher educators across disciplines. We encourage continued dialogue and research in these areas.

Note

¹ We use the term teachers to refer to both practicing teachers of mathematics and those individuals preparing to become mathematics teachers.

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