Building Support for Scholarly Practices in Mathematics Methods

edited by
Signe E. Kastberg
Purdue University

Andrew M. Tyminski
Clemson University

Alyson E. Lischka
Middle Tennessee State University

Wendy B. Sanchez
Kennesaw State University

IAP
INFORMATION AGE PUBLISHING, INC.
Charlotte, NC • www.infoagepub.com
CHAPTER 2

POLITICAL CONOCIMIENTO FOR TEACHING MATHEMATICS

Why Teachers Need It and How to Develop It

Rochelle Gutiérrez
University of Illinois at Urbana-Champaign

Contrary to popular belief and research, addressing equity in mathematics education will not simply come once teachers understand the content they are to teach; when they find accessible, quality, or motivating activities and instructional strategies to use with students; or even when they develop meaningful relationships with students. Many teachers find their biggest struggle lies in understanding and negotiating the politics in their everyday practice. This is particularly true in mathematics, where teachers may expect their work to be straightforward—universal and culture free (Martin, 1997; Powell & Frankenstein, 1997). Teachers have not been trained to negotiate their local politics. Even teachers who have shown substantial
success with students, especially ones who historically have been excluded from mathematics, suggest their knowledge of content, pedagogy, and students is not enough to maintain that success. Politics get in the way, their work is undermined, or they leave the profession.

Imagine if teachers were trained with as much skill and practice in dealing with the politics of teaching as they were with lesson planning, assessment, strategic instructional decisions, classroom management, connecting topics within mathematics, and relating to students. Instead of just carrying out local practices that are valued or have been in place for years, they might question whether those practices are in the best interest of students. They might be more inclined to engage in dialogue and influence others to consider new perspectives. Rather than stand by while new policies are being created that go against their sense of justice, they might advocate for their students or themselves, and perhaps more talented teachers might stay in the profession longer. In this chapter, I will argue (a) mathematics teaching is political, (b) mathematics teachers need political knowledge, (c) teacher education programs can develop political knowledge with teachers through particular activities, and (d) when mathematics teachers have opportunities to understand and deal with the politics of teaching, they are able to use that knowledge in their practice.

POLITICS OF TEACHING MATHEMATICS

All Teaching Is Political

Teaching has always been political, but we seem to be at an extreme point in history. We see talented and committed individuals reconsidering whether teaching will allow them to be the kinds of people they wanted to be when they entered this profession (Natale, 2014). As teachers are robbed of their ability to use professional judgment, even award-winning teachers are counseling the next generation of students to rethink teaching as a profession (Klein, 2014). Private and charter schools may be able to remain competitive because they can ask poor-performing students to leave or because they can simply close their doors if their school is no longer profitable (Seattle Education, 2015). Public school teachers know they must work with every student who walks through their doors. As such, part of teachers’ work is creating a counternarrative to stories of students not having enough “grit” (Tough, 2016) or the view that teachers are slackers (Rosemond, 2004).

More and more, corporate America and billionaires with no expertise in education seek to control our schools. In 2015, Eli Broad and his foundation announced they are moving forward with a $490,000,000 plan to privatize the Los Angeles public school system and build 260 new schools in the next 7 years. The campaign that will get families and teachers and Melinda Gates Foundation, as well as many others, interested in public education. The campaign to expand to student assessments and districts (Persson, 2015). Without student test scores, Pearson is allowed to stay in the profession.

Corporations are making huge profits assessing them, yet the benefits are not so clear. The Common Core than the Adding It Up report (National Council for Teaching and Learning, 2014) and Standards for School Mathematics had in our professional community. Standards are a move away from the “average of previous standards (NCTM, 2000) connect mathematics with students’ experiences and have been the focus of more NCTM press (Gojak, 2012), yet there is no mention Standards, and accommodations for an appendix, something only the test. Content-specific education prepares prospective teachers (PTs) and helps a teacher. Now, for-profit corporation states and the District of Columbia Performance assessment managed by Pe 300 to upload evidence of plans that the hopes of being positively evaluated for their performance, they are required to document schools where they are student teaching that is seeking to market them. So, in some ways, our PTs have for-profit corporation.

It is not always easy for PTs to unlearn the outside of new reforms. Take, for example, Readiness for College and Careers (I
who historically have been excluded from a fledge of content, pedagogy, and stu-
success. Politics get in the way, their profession.

Since much skill and practice in deal-
way are with lesson planning, assess-
room management, connecting to students. Instead of just carrying them in place for years, they are in the best interest of students.

age in dialogue and influence others than stand by while new policies are in place. They might advocate for the development of more talented teachers might chaperone, I will argue (a) mathematics teachers need political knowledge, and (b) when mathematics teachers deal with the politics of teaching, their practice.

ING MATHEMATICS

ill, but we seem to be at an extreme committed individuals reconsidering be the kinds of people they wanted tion (Natale, 2014). As teachers are tional judgment, even award-winning culation of students to rethink teach-
rate and charter schools may be able can ask poor-performing students to t their doors if their school is no lon-
5). Public school teachers know they lk through their doors. As such, part narrative to stories of students not or the view that teachers are slackers ca and billionaires with no expertise s. In 2015, Eli Broad and his foun-
forward with a $490,000,000 plan to

privatize the Los Angeles public schools (Blume, 2015). The goal is to create 260 new schools in the next 7 years and to launch a massive marketing campaign that will get families and the general public to embrace the idea that charter schools are the next great innovation for the nation. The Bill and Melinda Gates Foundation, as well as the Walton family, show similar interests in public education. The emphasis on charter schools is likely to intensify with the multimillionaire Betsy Devos, a leader in the school choice movement, as the new Secretary of Education. Curriculum development corporations like Pearson have capitalized on the standards movement to expand to student assessments and all of the related products to support districts (Persson, 2015). With teachers’ salaries and positions partly dependent on student test scores, Pearson is, in a very real sense, controlling who is allowed to stay in the profession.

Corporations are making huge profits by promoting new standards and ways of assessing them, yet the benefits to the public, and to students in particular, are not so clear. The Common Core State Standards are little more than the Adding It Up report (National Research Council, 2001) combined with the National Council for Teachers of Mathematics (NCTM) Principles and Standards for School Mathematics (NCTM, 2000), documents we already had in our professional community. In fact, the Common Core State Standards are a move away from the "equity principle," one of six key components of previous standards (NCTM, 2000) and a departure from the equity position statement (NCTM, 2008) that suggested teachers need to connect mathematics with students’ cultural roots and history. Equity has been the focus of more NCTM presidents’ messages than any other topic (Gojak, 2012), yet there is no mention of equity in the Common Core State Standards, and accommodations for “English/Language learners” are in an appendix, something only the tenacious teacher would find.

Content-specific education professors have always evaluated the work of prospective teachers (PTs) and helped decide who is qualified to become a teacher. Now, for-profit corporations control those decisions. Thirty-five states and the District of Columbia have adopted the edTPA, a teacher performance assessment managed by Pearson. Under this new paradigm, PTs pay $300 to upload evidence of planning, instruction, and assessment in hopes of being positively evaluated to become a teacher. As part of the process, they are required to document the kinds of textbooks used in the schools where they are student teaching, important information for a corporation that is seeking to market its products to those not already using them. So, in some ways, our PTs have become data collection agents for a for-profit corporation.

It is not always easy for PTs to understand both the upsides and down-
sides of new reforms. Take, for example, the Partnership for Assessment of Readiness for College and Careers (PARCC), one of two new national tests
given to measure student learning and growth. The PARCC test seeks to better support students by offering a national standard and holding schools accountable for reaching it, thereby making it easier for parents anywhere in the country to judge the ability level of their students, regardless of the state or neighborhood in which they reside. There are many upsides to ensuring all students are held to high standards, as some fear our nation relies too heavily on social promotion (Balingit & St. George, 2016). However, most PTs do not realize that because the PARCC test was never normed on a national population before requiring states to use it, the test is not a valid measure of learning.6 In fact, some educators have argued that schools are paying a corporation to norm the tests on the backs of their students (Gaines, 2015; Strauss, 2014) and are relinquishing upwards of 6 weeks of instruction to administer such tests. The first set of scores received by students was incredibly low, thereby justifying the need for states and districts to purchase additional materials from Pearson to raise those scores. The cycle often continues with more tests for students, little useful information for teachers about their students’ learning, and more profit for corporations. I served on the PARCC item review committee at the high school level. When I raised the issue with Pearson officials in 2013 about consistently low student test scores across the nation and what this meant for students’ futures, I was told that Pearson could not be held accountable for any decisions that school administrators made or what the public did with the test; Pearson was “just the people who make the tests.” Their goal at that time was for the PARCC test to replace the ACT so that they would gain market share in testing for college. To some extent, their goal is already being realized, as colleges in Delaware, Kentucky, New Jersey, and Colorado are using PARCC scores in admission decisions and entry-level credit for courses. And, although the state of Illinois has recently stopped using the PARCC test (Rado, 2016), most states are still spending millions of dollars on Pearson-related products for PARCC testing. Where corporations might have had market share in textbook adoption, now they are poised to gain market share in college testing. Moreover, Pearson has recently expanded its markets to countries such as the Philippines with Affordable Private Education Center (APEC) secondary schools (Kamnetz, 2016) and intends to impact more than 200 million students worldwide by 2025 (Pearson.com). The increased influence of corporate America, high-stakes testing, and the deprofessionalization of teachers are all signs of an extreme point in the history of public education.

There is so much happening in the public sphere that it would be hard for a PT to keep track of it all or know how to make sense of it without guidance. Most teachers cannot understand how corporations or “philanthropists” could make money off of public schools. I list here just a few things that I have shared with my PTs. Pearson has a $32 million contract to administer tests with the state of New Jersey (Sauterman, 2011; Phillips, 2014). California’s Common Core. PARCC and Smarter Balanced—U.S. Department of Education. There are or delays in reporting scores, design for testing, and untimely reporting of results not only teacher’s salaries but also the next level of schooling. For-profit companies used to decide who stays in teaching in the first place (e.g., edTPA) and a through this process. Pearson’s EnVisage creates claims of impact and generates a minimum of $320 million with a potential revenue stream of $2 billion. Race to the Top money, charter schools and other charter schools play by the rules Academy, a group of virtual classrooms, new standards and new products. Pearson places gag rules in test content questions about the tests. Pearson used social media to stop testing leaks (Strategic mathematics and reading language; the number is for aspiring lawyers who sit for the bar exam return. Pearson was implicated in an academic misconduct scandal in a $1.3 billion deal to provide test prep in the Los Angeles Unified School District.

Fortunately, there is a movement of teachers, students, and journalists who question that move beyond testing and public education. Providing a picture of what is happening in the past decade, we have had news coverage of a total of $3.7 billion in federal funding opened their doors (Persson, 2015).

As the influence of corporate America forces with others to reclaim this public sphere, that education should give up all testing and test scores, which are based on populations of students and which are not. Rather, in the Internet such as Fair Test, Change the Score, Creating Balance in an Unequal System for Social Justice, TODOS Mathematics are fighting for a definition of education that is based on the needs of students and the community.
The PARCC test seeks to national standard and holding schools making it easier for parents anywhere of their students, regardless of the reside. There are many upsides to en- standards, as some fear our nation relies (Linggit & St. George, 2016). However, the PARCC test was never normed using states to use it, the test is not a the educators have argued that schools tests on the backs of their students relinquishing upwards of 6 weeks of The first set of scores received by studying the need for states and districts Pearson to raise those scores. The for students, little useful information earning, and more profit for corpora-the review committee at the high school Pearson officials in 2013 about consist nation and what this meant for son could not be held accountable for s who make the tests.” Their goal at replacing the ACT so that they would gain o some extent, their goal is already be Kentucky, New Jersey, and Colorado in decisions and entry-level credit for Illinois has recently stopped using the are still spending millions of dollars ICC testing. Where corporations might adoption, now they are poised to gain over, Pearson has recently expanded philippines with Affordable Private Edu-s schools (Kamenez, 2016) and intends to inns worldwide by 2025 (Pearson.com). e America, high-stakes testing, and the e all signs of an extreme point in the he public sphere that it would be hard now how to make sense of it without derstand how corporations or “philan- if public schools. I list here just a few s. Pearson has a $32 million contract to administer tests with the state of New York and $500 million in Texas (Ot- terman, 2011; Phillips, 2014). California is spending $900 million on Common Core. PARCC and Smarter Balanced received $330 million from the U.S. Department of Education. There is a long history of errors in scoring or delays in reporting scores, design flaws, insufficient memory in systems for testing, and untimely reporting of scores. Students’ test scores influence not only teacher’s salaries but also students’ chances of getting into the next level of schooling. For-profit corporations are in control of not only tests used to decide who stays in teaching but also who becomes a teacher in the first place (e.g., edTPA) and are collecting data about textbook use through this process. Pearson’s EnVisionMATH has been found to exag- gerate claims of impact and generalizability to students of all ability levels, while grossing a minimum of $320 million per year on one this product, with a potential revenue stream of $2 billion/year (Singer, 2014). Fueled by Race to the Top money, charter schools are popping up everywhere. (KIPP and other charter schools play by their own rules. Pearson owns Connections Academy, a district of virtual charter schools.) Corporations encourage new standards and new products for districts (yet little new content). Pearson places gag rules in test contracts to prevent teachers from raising questions about the tests. Pearson has been caught monitoring kids’ social media to stop testing leaks (Strauss, 2015). Students who take PARCC mathematics and reading language arts tests will spend more time testing than aspiring lawyers who sit for the bar exam. And they will get nothing in return. Pearson was implicated in an FBI investigation for unfair bidding practices in a $1.3 billion deal to provide curriculum via iPads to students in the Los Angeles Unified School District (Singer, 2014).

Fortunately, there is a movement of growing resistance from parents, teachers, students, and journalists who are bringing together visions of edu- cation that move beyond testing and to highlight the lack of transparency and the attacks on public education. Researchers crunching large data are providing a picture of what is happening in public education, noting that, in the past decade, we have had nearly 2,500 charter schools that have received a total of $3.7 billion in federal funding but have closed or never opened their doors (Persson, 2015).

As the influence of corporate America intensifies, individuals are joining forces with others to reclaim this profession of ours. Their response is not that education should give up all testing. National tests have helped us under- stand which populations of students are being served well by the school system and which are not. Rather, individuals are finding resources on the internet such as Fair Test, Change the Stakes, New York Core, Saving Our Schools, Creating Balance in an Unjust World, Rethinking Schools, Teachers for Social Justice, TODOS Mathematics for All, and many local groups who are fighting for a definition of education that moves beyond standardized
tests. Some teachers and principals are taking matters into their own hands by writing blogs to help distribute information to help families opt out of high-stakes tests (LaReviere, 2015). Others are writing letters to their students or to public officials that can create a wider public debate about not just testing but the nature of education and its place in our society (Goosetree, 2015; Lifshitz, 2015; Look-Ainsworth, 2015; Vilson, 2012).

Although these politics affect everybody, inner-city schools that lack the infrastructure or resources to carry out newer assessments or whose students need more support to reach learning goals based on new standards are more severely impacted. With edTPA and its associated text-heavy forms of evaluation, we may be discouraging or preventing individuals whose first language is not English from entering teaching. Given such politics, it is hard to imagine that we will be able to recruit and retain a large cadre of teachers of color into the profession. Regardless of where they work, PTs and mathematics teacher educators (MTEs) alike will need support to deepen their knowledge of the sociopolitical context of mathematics teaching and learning so that they can make informed decisions about their work (Association of Mathematics Teacher Educators [AMTE], 2017).

All Mathematics Teaching Is Political

How do the aforementioned politics relate to mathematics education in particular? I take as an example two schools—Raileside and Union. Raileside is a school in Northern California so noted for its success in mathematics that it has been studied by various researchers (Boaler, 2006; Boaler & Staples, 2008; Horn, 2004; Jilk, 2010; Nasir, Cabana, Shreve, Woodbury, & Louie, 2014); Union is a school in Chicago, also noted for its success (Gutiérrez, 1999, 2002a, 2014). Both schools serve low-income, largely Latin@/x populations; both have had teachers who underwent extensive professional development for students to develop conceptual understanding over mere procedures; both have created a departmental community that held a common vision for advancement and a commitment to all students; both have used the Interactive Mathematics Program (Alper, Fendel, Fraser, & Resek, 1997) and showed clear signs of success. Their students have demonstrated the ability to make conjectures and defend their arguments publicly, attained higher test scores than peers in other schools, demonstrated higher classroom engagement overall, and produced a unimodal distribution of engagement from adolescents of different backgrounds. Students have worked in two languages, and a higher percentage of students took calculus (over 40% of the senior class at Union in the 1998–1999 school year).

Yet the efforts of both of these high school mathematics departments were derailed by district politics—a back-to-basic-skills movement in Chicago and a teaching-to-the-test mantra at both locations, highly successful teachers succumbed to district mandates that students or left their school or the profession not alone. We see pockets of success and are getting historically excellent test scores of mathematics and to perform although the public and many math teachers believe that the most difficult part of the job is getting teachers to develop deep and to adopt particular pedagogical practical problem with a technical solution come into play, and these are the heart.

Is it just mathematics teaching that thing about mathematics as a discipline, or are across the globe have begun edge, power, and identity are interlinked in the sociopolitical turn (Gutiérrez, 2015). Early examples that highlighted relations to teaching, learning, and teaching political dimensions of mathematics (2004); a “socio-political orientation” in mathematics education (V example, Chronaki 1999) suggesting education should focus on “fostering emancipation” as their goal. Whereas sociopolitical emancipation. In writing about the problem, the word because I did not in particular, and the political (issues) extracted from each other—there is no one mainline, and in fact, sometime after 2010, when most researchers seem to have adopted socio-political.

The way mathematics operates in the United States brings are important for MTEs, and mathematics itself operates as Whiteness. Who, mathematics, who is capable in mathematematical community is generally curricula emphasizing terms like geometry. A perception that mathematics was lack of understanding of what it means to be European. Perhaps more importantly, privilege in society, just like Whiteness.
ecommend e
taking matters into their own hands to help families opt out of
others are writing letters to their stu-
create a wider public debate about not
in and its place in our society (Gosse-
body, inner-city schools that lack the
out newer assessments or whose stu-
taining goals based on new standards
TPA and its associated text-heavy forms
or preventing individuals whose first
ng teaching. Given such politics, it is
to recruit and retain a large cadre
Regardless of where they work,
tors (MTEs) alike will need support to
political context of mathematics teach-
e informed decisions about their work
Educators [AMTE], 2017).
ics relate to mathematics education in
schools—Railside and Union. Railside
lated for its success in mathematics
searchers (Boaler, 2006; Boaler & Sta-
sir, Cabana, Shreve, Woodbury, & Lou-
g, also noted for its success (Gutiér-
s serve low-income, largely Latinx/x3
who underwent extensive professional
conceptual understanding over mere
mental community that held a com-
mitment to all students; both have
gram (Alper, Fendel, Fraser, & Resek,
Their students have demonstrated
| defend their arguments publicly, at-
other schools, demonstrated higher
produced a unimodal distribution of
different backgrounds. Students have
er percentage of students took calcu-
gh school mathematics departments
— a back-to-basic-skills movement in

Chicago and a teaching-to-the-test movement in Northern California. In
both locations, highly successful teachers were demoralized and either
succumbed to district mandates that went against their professional judg-
ments or left their school or the profession altogether. These schools are
not alone. We see pockets of success every day where teachers are working
hard and are getting historically excluded students to see themselves as
doers of mathematics and to perform well in coursework and on tests. So
although the public and many mathematics education researchers seem to
believe that the most difficult part about addressing issues of equity is how
to get teachers to develop deep and flexible knowledge of mathematics or
to adopt particular pedagogical practices, addressing equity is not a tech-
nical problem with a technical solution. Values, morals, and judgments all
come into play, and these are the heart of politics.

Is it just mathematics teaching that is political, or is there actually some-
thing about mathematics as a discipline that is political? A number of re-
searchers across the globe have begun to highlight the ways in which knowl-
edge, power, and identity are interwoven with mathematics, something
called the “sociopolitical turn” (Gutiérrez, 2010/2013; Stinson & Bullock,
2015). Early examples that highlighted how power, identity, and knowledge
relate to teaching, learning, and teacher education named these as “socio-
political dimensions of mathematics education” (Valero & Zevenbergen,
2004); a “socio-political orientation” (Chronaki, 1999, p. 19); or simply
“power” in mathematics education (Walkerdine, 1988; Walshaw, 2001). For
example, Chronaki (1999) suggested that a “political view on mathematics
education” should focus on “fostering of citizenship” (p. 19). In general,
one distinction is that sociocultural dimensions tend to have enculuration
as their goal, whereas sociopolitical dimensions concern themselves with
emancipation. In writing about the sociopolitical turn, I chose not to hy-
phenate the word because I did not believe the social (issues of identity
in particular) and the political (issues of power in particular) could be ex-
tracted from each other—there is no social without political and vice versa.
In fact, sometime after 2010, when the sociopolitical turn was published,
most researchers seem to have adopted the term sociopolitical instead of
socio-political.

The way mathematics operates in our world and the politics that math-
ematics brings are important for MTEs to consider. On many levels, mathe-
matics itself operates as Whiteness. Who gets credit for doing and developing
mathematics, who is capable in mathematics, and who is seen as part of the
mathematical community is generally viewed as White. School mathematics
curricula emphasizing terms like Pythagorean theorem and pi perpetuate
a perception that mathematics was largely developed by Greeks and other
Europeans. Perhaps more importantly, mathematics operates with unearned
privilege in society, just like Whiteness. Mathematics is viewed as so pure that
it has become the discipline by which we measure other disciplines. See for example, the XKCD comic (n.d.) that depicts mathematicians so far removed from other disciplines that they hardly recognize other scientists.

We treat mathematics as if it is a natural reflection of the universe. When we identify mathematics in the world around us (e.g., Fibonacci sequences in pinecones, fractals in snowflakes), we convince ourselves that mathematics occurs outside of human influence. Rather than recognizing that we may see patterns we want to see (because we set the rules for finding them), we instead feel mathematics is a way of encoding the universe with eternal truths, a natural order of things that should not be questioned. And so mathematics is viewed as a version of the world that is proper, separate from humans, where no emotions or agendas take place.

Because of its perceived purity, we assume mathematics should be the basis for how we think about the world and what is important. Currently, mathematics operates as a proxy for intelligence. Society perpetuates the myth that there are some people who are good at mathematics and some who are not (Mighton, 2004). If you tell someone you are a mathematician or mathematics educator, often you are met with two reactions: confession (e.g., "I was never really good at mathematics") or adulation ("You must be really smart!"). As MTEs, we need to ask ourselves whether we are challenging that adulation or simply accepting it because we enjoy the benefits of increased status and economic gains. Are we really smart just because we do mathematics? As researchers, are we more deserving of large grants because we focus on mathematics education and not social studies or English? Is there something inherent in mathematics as a discipline and human activity that merits higher prestige and higher paychecks?

When we combine the belief that mathematics operates with no values, no judgments, no agenda, with the idea that it properly confers intelligence and importance in society, it can impact how one thinks of oneself. Beyond how well students do in mathematics courses or whether they can imagine themselves pursuing a STEM-based career, they are influenced by this notion of what counts as intelligent. If one is not viewed as mathematical, there will always be a sense of inferiority that can be summoned, especially because the average citizen will not necessarily question the role of mathematics in society. The effects are lasting. So many people are walking around in society who have experienced trauma, microaggressions from participating in math classrooms where the idea of being a successful person, being an intelligent person, is removing oneself from the context, not involving emotions, not involving the body, and being judged by whether one can reason abstractly. Those are all messages that we can unknowingly transmit. It is not just that teaching is political; mathematics is also political. Therefore, whether we recognize it or not, mathematics teaching is a highly political activity.
we measure other disciplines. See for
depicts mathematicians so far removed
r recognize other scientists.
ral reflection of the universe. When
r around us (e.g., Fibonacci sequences
we convince ourselves that mathemat-
cc. Rather than recognizing that we
we use we set the rules for finding them),
of encoding the universe with eternal
it should not be questioned. And so
the world that is proper, separate from
tas take place.
e assume mathematics should be the
rd and what is important. Currently,
  intelligence. Society perpetuates the
o are good at mathematics and some
tell someone you are a mathematician
re met with two reactions: confession
ematics" or adulation ("You must
t to ask ourselves whether we are chal-
ging it because we enjoy the benefits
ins. Are we really smart just because
re more deserving of large grants
ication and not social studies o: Engl-
hematics as a discipline and human
id higher paychecks?
athematics operates with no values,
e that it properly confers intelligence
aptic how one thinks of oneself. Be-
ematics courses or whether they can
-based career, they are influenced by
ent. If one is not viewed as mathemati-
ciety that can be summoned, espe-
nt necessarily question the role of
re lasting. So many people are walking
ed trauma, microaggressions frome the idea of being a successful per-
oving oneself from the context, not
 e body, and being judged by whether
all messages that we can unknowingly
political; mathematics is also political.
r not, mathematics teaching is a highly

All Mathematics Teachers Need Political Knowledge
to Be Successful

When we acknowledge a sociopolitical perspective on mathematics education, it raises questions about whether PTs are receiving the kinds of knowledge and skills they need. Many are being prepared as if once they develop "ambitious" teaching practices (Lampert et al., 2013) they will be rewarded for their efforts and their students will learn. As we saw in the cases of Union and Railside High, this reality does not exist. High-stakes education, Response to Intervention initiatives, Race to the Top campaigns, and the latest packaged reforms can keep us from acting on what is in the best interest of our students and their learning. In terms of preparing teachers to become professionals, there is nothing in edTPA that will assess whether PTs can successfully deconstruct the deficit messages about teachers, students, or public education in movies like Waiting for Superman (Guggenheim & Kimball, 2010) or Won't Back Down (Barnes & Hill, 2012). Nor can the edTPA identify teachers who can see limitations in the latest reform movements like “growth mindset” or “grit.” On the surface, these movies and reforms address equity by helping students get a better education. However, the savvy educator understands that these movies have the best interests of charter schools and corporate America in mind, instilling the idea that public schools need a hostile takeover. An effective teacher can realize that growth mindset and grit, although important characteristics for students, situate the problem of learning in individual student motivation and ignore broader institutional and systemic inequities. If teachers are unable to deconstruct the deficit messages circulating in society about themselves, their students, or public education, they cannot successfully advocate for policies and practices that are research-based or ethically just.

The majority of professional development that PTs and practicing teachers receive from teacher education programs, their districts, and professional societies like NCTM do not focus on helping teachers understand or negotiate the politics they regularly face. Though we have made many advances in such things as how to appropriately use technology or how to build upon the linguistic and cultural resources that students bring to school, most programs in teacher education still work largely from the same set of assumptions about the kinds of knowledge bases teachers of mathematics need, which were developed in the late 1980s. Whether we call it pedagogical content knowledge (Shulman, 1986) or mathematical knowledge for teaching (Hill et al., 2008), teachers are expected to become fluent in content knowledge, pedagogical knowledge, and knowledge of students.
POLITICAL CONOCIMIENTO FOR TEACHING

I am arguing for a fourth kind of knowledge—political knowledge for teaching. I refer to this knowledge as *political conocimiento*, and I explain more thoroughly what that means in other papers (Gutiérrez, 2012, 2013b). What is important to understand here is that although the Spanish term *conocimiento* translates to "knowledge" in English, I am borrowing a version from Anzaldúa (1987) that acknowledges that all knowledge is relational. Things cannot be known objectively; they must be known subjectively. This is comparable in English to when we say, "Do you know that restaurant?" We are not expecting that knowledge to be a universal objective set of facts. Instead, the speaker is getting at your relationship with that restaurant: Are you familiar with it? What experiences do you have with it? Your knowledge of that restaurant may overlap with the knowledge that others have of it, but it will not be the same. For our purposes, key features of *conocimiento* are subjectivity, solidarity with others, and interdependence.

For mathematics teachers, political *conocimiento* is the kind of knowledge that helps you deconstruct and negotiate the world of high-stakes testing and standardization. It helps you connect and explain your mathematics to community members and district officials. It buffers you from a system or helps you reinvent or reinterpret systems so that you can be an advocate for your students. In essence, political *conocimiento* is the kind of knowledge that allows you to see how politics permeates everything we do, in education in general and mathematics in particular, and affects how we are connected to each other today and how we might envision a different, more humane connection for the future.

The key difference in this model versus other models is the idea that knowledge is with students and communities, not knowledge of them or for them (see Figure 2.1). We come to "know" students not in some kind of

![Figure 2.1](image)

**Current Visions of Teacher Knowledge** (Shulman, 1986)

**Political Conocimiento for Teaching Mathematics** (Gutiérrez, 2012)

---

Creative Insubordination

When PTs are developing political airs and do something to address the injustices, then subordination comes into play. Creative Insubordination is a term I heard growing up in the 1980s as a term to describe someone who is irregular in the community. I later learn that this term was used by my grandmother to describe herself and her family.
INTENTO FOR TEACHING

Conocimiento—political knowledge for teaching Mathematics (Gutiérrez, 2012, 2013b). Political knowledge is relational. To be known subjectively, this knowledge must be known subjectively. This is not to say, “Do you know that restaurant?” It is to be a universal objective set of facts. In that relationship with that restaurant, are you do you have it? Your knowledge of knowledge that others have of it, but your possession of knowledge are the key features of conocimiento are interdependence.

Al conocer conocimiento is the kind of knowledge that constructs the world of high-stakes testing and explains your mathematics to officials. It buffers you from a system so that you can be an advocate. Al conocer conocimiento is the kind of knowledge that permeates everything we do, in education, in particular, and affects how we are construed as we might envision a different, more just versus other models. The idea that minorities, not knowledge of them or for “know” students not in some kind of objectified way (Gutiérrez, 2009) but rather by standing alongside them, committed to being interdependent with them. All of this work is done not as individual teachers but in a supportive community with others. The term el mundo zurdo recognizes this community as the left-handed world of solidarity among people of color, people who are queer, historically looted, physically challenged, and resisting various forms of colonization (Moraga & Anzaldúa, 1981). The presence of the term histories in society recognizes that mathematics has been and is being practiced in different ways throughout the world. We are in a particular moment in time, not just in terms of modern mathematics, but in terms of what is happening with respect to mathematics and education today.

PTs who have developed political conocimiento—that useful knowledge that helps them deconstruct deficit narratives in society about students, teachers, or public education—are better prepared to question the world around them and to use their professional judgment when making decisions about the kinds of learning opportunities students need. They can see the benefits of using achievement data as a first step to identify who is not being served well by the school system, but they recognize the limitations of defining equity around such things as “closing the achievement gap.” They understand that, more than just getting all kids to perform better or the same on tests of achievement, we should be invested in helping students become the kinds of people they want to be, fulfilling goals they have defined for themselves, which can mean different, not same outcomes (Gutiérrez, 2002b). Teachers with political conocimiento are able to question authority when outside entities come in and tell us that we need to focus on “bubble kids” or that we need to develop a “growth mindset” in our students. If we are telling students that it is really important for them to develop perseverance and grit or grow new dendrites to get smarter, but the system remains stacked against them, is that really a healthy perspective to promote? From the point of view of students of color and historically looted students, does that just sound like a new version of “pull yourself up by your bootstraps”? When PTs and practicing teachers lack political conocimiento, they can unknowingly adopt simplistic reform packages and slogans that make them feel they are effectively addressing equity and social justice.

CREATIVE INSUBORDINATION

When PTs are developing political conocimiento, they often feel a desire to do something to address the injustices they witness. This is where creative insubordination comes into play. Creative insubordination is a term grounded in the 1980s, a term I heard growing up in an activist family, a term used on a regular basis in my community. I later learned that creative insubordination
was published in literature on principal leadership because some principals were found to stand up to the establishment to protect their teachers when decisions were being made that did not seem fair (Crowson & Morris, 1985). I find it extremely helpful for naming the work that community leaders and exceptional teachers do as a matter of their everyday practice (Gutiérrez, 2015a, 2015b; Gutiérrez & Gregson, 2013; Gutiérrez, Irving, & Gerardo, 2013). Creative insubordination recognizes innovative work that individuals, in collaboration with others, do when they need to get a job done but when doing so will be met with resistance from those protecting the status quo. Teachers who are creatively insubordinate learn to bend rules and interpret things in ways that rely on a higher ethical standard. Rather than simply following what others around them are doing or telling them to do, they reflect deeply and base their decisions on professional judgment guided by doing right by students. I emphasize the creative part to highlight the fact that this work is not done foolishly or naively. It is done in a way that keeps teachers from being fired. In this sense, like any other professional knowledge, it requires skill and precision.

Teacher Education Programs Can Develop Political Knowledge

One set of issues in which mathematics teachers need to be able to reinterpret or bend rules is equity. When PTs enter classrooms for observation or student teaching, they receive strong messages that equity is about the achievement gap; equity is about growth mindset; equity is about grit and other things. So before they enter those sites, I try to help them grapple with a more sophisticated notion of equity. I present for them four dimensions of equity/learning (Figure 2.2) that they should consider: access,

![Figure 2.2 Dimensions of equity/learning.](image)

achievement, identity, and power (Gutiérrez, 2006). In doing so, they come to recognize our work as mathematics teaching. That is, our work can remain neutra or policymakers as well as the students, if we adhere to a mainstream definition of equity (e.g., students having terms like “quality” teachers and “rigorous courses taken, equal representation, refer to collectively as the dominant a set of beliefs held by most educators. But we ask ourselves, is this definition of equity about the kinds of identities that students can identify in their classrooms? Does this definition of equity seen as legitimate participants in mainstream definitions of equity make sense if we understand that the historical and cultural aspects of mathematics encourage inequities in one’s home communities?

What I aim for in my teacher education is away asking themselves, “For any given learning that circulate in society and understand the importance of identity on the diagram. Here, I mean critical in a critique of the status quo. This arises from students’ perspectives. Whence “equity for what purpose and from whom”?

The four dimensions of equity/learning space. Rather than being a default to the four dimensions provide language; that is, the teaching of mathematics for all, closing the achievement gap. This language also helps PTs involve helping students to “play the game” and develop proficiency in standardized tests and develop proficiency...
pal leadership because some principals shunt to protect their teachers when it seems fair (Crowson & Morris, 1985). I see work that community leaders and everyday practice (Gutiérrez, 2013a, b, 2013). Innovative work that individuals, in collaboration to get a job done but when doing so protecting the status quo. Teachers who bend rules and interpret things in ways. Rather than simply following what others them to do, they reflect deeply and base the fact that this work is not done that keeps teachers from being fired. In knowledge, it requires skill and precision.

Develop mathematics teachers need to be able to reinft PTs enter classrooms for observation and grapple with messages that equity is about the right mindset; equity is about grit and those sites, I try to help them grapple for. I present for them four dimensions (2) that they should consider: access, achievement, identity, and power (Gutiérrez, 2007, 2009) and get them to identify particular scenarios as being more or less about particular dimensions (Gutiérrez, 2006).

In doing so, they come to recognize the complexity and tensions that play out in our work as mathematics teachers (Gutiérrez, 2009, 2015a, 2015b). That is, our work can remain neat and tidy, aligned with most administrators and policymakers as well as the general public, including many parents, if we adhere to a mainstream definition of equity that concerns itself only with access (e.g., students having equal opportunities to learn, loaded terms like “quality” teachers and “rigorous” curriculum) and achievement (e.g., equal outcomes on standardized tests, equal numbers of mathematics courses taken, equal representation in the STEM pipeline). This is what I refer to collectively as the dominant axis of equity because it dominates the beliefs held by most educators, parents, and policymakers. But we might ask ourselves, is this definition of equity/learning adequate if we also care about the kinds of identities that students develop inside and outside of our classrooms? Does this definition of equity reflect justice if, in order to be seen as legitimate participants in mathematics, students can only follow the “standard algorithm” or speak English while doing mathematics? Does this definition of equity make sense if students never come to understand the historical and cultural aspects of mathematics as a human practice? Does this definition of equity encourage teachers to model how mathematics can be used as a lens to identify inequities in society and to then address those inequities in one’s home community? Or is it simply concerned with students getting good grades and access to college?

What I aim for in my teacher education courses is that PTs will walk away asking themselves, “For any given definition of equity, who benefits?” When given the opportunity to think deeply about definitions of equity and learning that circulate in society and in coursework, most PTs are able to understand the importance of identity and power, which is the critical axis on the diagram. Here, I mean critical not as in fundamental or key, but as in a critique of the status quo. This axis considers what will be meaningful from students’ perspectives. Whenever we think of equity, we always ask, “equity for what purpose and from whose point of view?”

The four dimensions of equity/learning are a useful taxonomy and mapping space. Rather than being a definition that PTs will adopt uncritically, the four dimensions provide language for discussing more nuanced situations that arise in the teaching of mathematics, something that terms like mathematics for all, closing the achievement gap, or simply equity do not easily capture. This language also helps PTs recognize that part of their job may involve helping students to “play the game” of mathematics, as in do well on standardized tests and develop proficiency in the eight Standards for Mathematical Practice (National Governors Association, 2010). Not to attend to
such goals would put students in jeopardy of not having all options open in terms of career, college, or earning potential. The goal would be to attend to this axis at least enough for students to decide their own futures rather than having others dictate those futures. But another part of teaching may involve helping students to “change the game”—supporting students’ identities and power, even when those are at odds with things like scoring well on standardized tests. Helping students to change the game may arise by using social justice mathematics curricula (Esmonde, 2014; Gregson, 2013; Gutstein, 2003, 2006; Turner & Strawhun, 2005) or assigning projects that draw upon students’ experiences in home communities (Aguirre, Zavala, & Katanyoutant, 2012; Turner, Gutierrez, & Diez-Palomar, 2011). It could also involve changing the ways that we, as teachers, relate with mathematics and with our students and, again, it may require us to use our own sense of justice rather than that provided by our school or district. Changing the game is important because by not preparing students to do so, teachers are potentially keeping students from becoming the kinds of people they aim to become or from seeing a broader and more humane version of the activity we call mathematics. PTs may grapple with these cross-cutting goals, but those goals force them to think about their stance. What are they willing to stand for as a teacher? What definition of social justice will they use, and how will they know they are achieving it? A sophisticated definition of equity/learning would not allow a teacher to know she is achieving it without input from her students.

In the center of the diagram, there is the concept of Nepantla, a form of Nahua metaphysics. Nepantla is not only a space of tensions but from a kind of cosmological perspective is a way of interacting in the world that recognizes opposing forces and values and maintains those tensions rather than trying to shut them down (Anzaldúa, 1987; Anzaldúa & Keating, 2002). It is different from how we traditionally think of dealing with opposing views. Many PTs are familiar with cognitive dissonance, the psychological discomfort one experiences when recognizing two viable but seemingly irreconcilable perspectives (Festinger, 1957). They are able to value the idea that noticing competing views is an important component to motivating change in students. However, the goal in cognitive dissonance is to eliminate the dissonance, to choose one thing over another. With Nepantla, we want to maintain that dissonance for a while, to become comfortable with the tensions, because that is how we develop new knowledge.

The idea of Nepantla not only allows me to help PTs grapple with important tensions and ethics in teaching mathematics, it allows them to recognize that if their work as teachers will involve helping students to play the game and change the game, they, as teachers, will need to be able to do so as well. And by extrapolation, we as MTEs will need to learn how to play the game and change the game, a point I will return to later in this chapter.
As I have described, one way to help develop teachers’ political conocimiento is to offer opportunities for them to interrogate mainstream definitions of equity, learning, and mathematics. By introducing a framework and a language for talking about mathematics teaching, MTEs help them learn to question the status quo in ways that set the stage for them to question the status quo in schools where they may work one day.

**Conceptual Framework**

Elsewhere, I have described how my research team and I created a program that allows us to support teachers to more fully develop political conocimiento with each other (Gutiérrez, 2015a; Gutiérrez et al., 2013). Figure 2.3 shows some of the key structural and conceptual components of our model.

This is our tapestry weave framework, and we use it to show that there are certain structural components—seminars, a teacher partnership, critical professional development sessions, an after-school mathematics club, and mentoring—that support the kinds of conceptual ideas we value. Broadening and challenging knowledge, developing an advocacy stance, noticing

![Diagram](image-url)

**Figure 2.3.** Conceptual framework for teacher education.
multiple interpretations, and rehearsing for creative insubordination are all things that we hope our PTs will develop as they move through the program. Our model involves more than just readings and reflections. The structural components provide the backbone for the conceptual components to take root, and all of these threads intertwine and provide support for each other to create the tapestry. At times, it involves becoming a Nopantler® (one who is comfortable living with tensions) and also becoming the “other” (one who is marginalized). It involves engaging with youth in nonschool settings and engaging with others who model creative insubordination, and it will help them rehearse for the kinds of political encounters that they will face as teachers. This model highlights that no single activity or aspect of the methods courses I teach prepares teachers to develop political conocimiento. Instead, they are exposed to a variety of situations and course assignments that reinforce that they should take seriously the idea that being a professional requires making professional judgments in connection with others; that such judgments require political clarity, a commitment to ethics, and that such judgments need to be defensible to parents, students, and other stakeholders. This is the basis upon which teachers will be able to carry out creative insubordination in their future work environments.

The Mirror Test

One key feature of the language and philosophy that undergirds my teaching is something I call the Mirror Test. The Mirror Test is a way of thinking about the profession that uses one’s internal ethical compass as opposed to an external one, whether external is corporate America or one’s district or professional society’s ways of measuring whether one is a qualified professional. The Mirror Test suggests PTs look themselves in the mirror and ask: “Am I doing what I said I wanted to do in education when I set out to be in this profession? And, if I’m not, what am I going to do about that?” I do not mean to imply that a teacher candidate simply writes out why they want to enter teaching, what they plan to do, and then constantly returns to that list over the course of their career in order to decide if they are doing a good job. New teachers do not know everything they plan to stand for in teaching when they start out. What constitutes the Mirror Test is constantly being refined by the kinds of new knowledge bases, experiences, and solidarities that one creates with other groups. At the heart of the Mirror Test are one’s core values and the willingness to act upon those values in order to advocate for students.

In My Shoes

In My Shoes is an activity I use with PTs during one of four methods courses. It provides PTs an opportunity to rehearse creative insubordination strategies and is explained in greater detail in the chapter by Gutiérrez.
ing for creative insubordination are all top as they move through the program. Readings and reflections. The structural for the conceptual components to take in and provide support for each other selves becoming a Nepantler (one who and also becoming the “other” (one aging with youth in nonschool settings) creative insubordination, and it will political encounters that they will face that no single activity or aspect of the teachers to develop political conocimiento. of situations and course assignments seriously the idea that being a profes-judgments in connection with others; al clarity, a commitment to ethics; and enable to parents, students, and other which teachers will be able to carry out ute work environments.

...and philosophy that undergirds my Mirror Test. The Mirror Test is a way of uses one’s internal ethical compass as her external is corporate America or r’s ways of measuring whether one is a fest suggests PTs look themselves in the said I wanted to do in education when I if I’m not, what am I going to do about a teacher candidate simply writes out at they plan to do, and then constantly if their career in order to decide if they do not know everything they plan to out. What constitutes the Mirror Test kinds of new knowledge bases, experienes with other groups. At the heart of s and the willingness to act upon those ents.

with PTs during one of four methods unity to rehearse creative insubordin-eater detail in the chapter by Gutiérrez, Gerardo, and Vargas (see Chapter 10). The activity begins with a teacher leader (a practicing teacher, student teacher, or peer) describing a difficult situation in which they found themselves and were unsure what to do. It could be a new policy that is being enacted in the mathematics department or a new textbook adoption that does not seem to have students’ best interests in mind. It could be hearing a colleague remark, “Students can’t handle a more rigorous curriculum” or a student who says, “I can’t believe she’s not helping me just because I’m Black.” In essence, the teacher leader is asking the group, “What would you do if you were in my shoes?”

After a scenario is raised with the group, several rounds of discussion and a role-play ensue. PTs discuss the situation and ask clarifying questions of the teacher leader who presented the scenario without the teacher leader revealing the response to that scenario. The facilitator then normally repeats back to the group the list of possible actions that have been offered. Next PTs identify, partly upon consensus in the group, which of the possible actions seems most worthy of taking up further through discussion, with the idea in mind that it will be the focus of the rehearsal or role-play. A member of the group volunteers or is chosen to become the main actor (protagonist) in the scenario. The role-play may take place immediately or, on the rare occasion, the protagonist may be asked to leave the room while others prepare for their roles. PTs role-play, with one member of the group acting as the protagonist who carries out the recommended action. Other members of the group take on different roles, including playing devil’s advocates who aim to make it difficult for the protagonist to carry out their action in a productive manner. In this phase, the teacher leader takes on the role of the antagonist, or the one who caused the difficult situation in the first place. Next, PTs debrief how the role-play went, including how the protagonist felt about their actions and whether there was anything they might do differently. Other members offer feedback on which points of the role-play they thought the protagonist performed well and which points (including actions by the antagonist or devil’s advocates) seemed to derail their efforts. The entire process can take upwards of an hour.

Unlike other kinds of rehearsals that may be scripted or are focused on a particular thing to learn about teaching, these role-plays are organic and are dependent on the perspectives and lived experiences of members of the group. The goal of this activity is not to prepare PTs for all of the important or even likely scenarios that they will face in their first few years of teaching. Rather, In My Shoes is an opportunity to reflect on all of the possible things they might do in a given situation and to feel what it will be like to engage in the complex process of negotiation inherent in situations where power dynamics are at play, where others will not necessarily agree with their points of view. More importantly, In My Shoes allows PTs to practice responding in a strategic manner and feeling all of the emotions that
come with trying to articulate your view in the moment and standing up for something you feel is right.

From the point of view of the PTs, they know that the goal is not to come up with the right answer to the scenario. They also know that they are not simply trying to guess what the person who is offering the scenario actually did as a response. The beauty of In My Shoes is that one must learn to think like a marathoner, not a sprinter. Rather than going after every fight in a school, PTs need to pick their battles. They need time to ponder which things most warrant taking a stand. With The Mirror Test, one cannot stand for everything and all people and all things; one must have political clarity and pick the things that are really important in terms of advocating for students. These are the things that will run through one's mind when looking in the mirror each day. PTs, at this stage of their career, need to consider a variety of moves that they could use and the kind of language that would accompany those moves. Rather than assuming that PTs will figure out on their own or see examples of it in their school placements, we structure opportunities for them to learn these moves. Negotiating the local politics in schooling is not a simple thing. Like other aspects of teaching that benefit from planning and rehearsals, helping PTs learn to deal with politics in a creative way that advocates for students while allowing them to keep their jobs is also an important skill worthy of rehearsing.

**Teachers Learning Political Conocimiento**

One way I identify if teachers have grown in their political conocimiento is when they participate in more sophisticated ways with others (e.g., peers, instructors, people in schools), more like professionals who have a clear stance on the field and less like students who are pleasing their professor or simply following what their cooperating teacher does (Brown & McNamara, 2005). Early in their program, few PTs see teaching as a political act; almost none would agree that mathematics is political. By the end of the program—partly through assignments where they are required to follow blogs or Twitter feeds; develop a working definition of mathematics; create critical dialogues with their cooperating teachers; and reflect on current events in teacher evaluations, national assessments, and learning standards—they are slowly exposed to the politics of teaching, and most demonstrate their understanding that teachers often need to take a stand one way or another if they are going to be able to look themselves in the mirror. It is unreasonable to expect PTs to have the level of sophistication that veteran teachers who possess political conocimiento would. Instead, I look for signs of growth. Those include the ability to deconstruct competing messages about concepts like equity, mathematics, and learning that circulate in society; consideration of not just systemic, and institutional aspects of students; the propensity to take a stand look like in practice; and a well-developed claims that they are putting students approach to teaching.

With respect to In My Shoes, in able to move from immediately suggesting the importance and weighing the different kind see growth when PTs are not just will text of the situation and are able to to the situation, but are willing to be Other signs of growth are making a scenario and other scenarios they have role-play. They might remark, "So, so week in my school." If PTs can make meta-analysis—recognizing that two or more things have the same underlying theme—that will also allow them to see how discourses that operate in schools. As new scenarios are presented, the group regards the idea that political situations have easy. I liken our teachers who are good at talking to teachers who get good at identifying the right language to use. They develop a shared language and other that is meaningful and useful for discussing politics.

Partly as a result of various opportunities and rehearsals for political situations with whom I have worked report doing a lot of work for students. Some of these students were able to use what they learned for a year or more. They include taking a stand in a given situation and organizing with other teachers in the school who did not want to explicitly inform parents out of high-stakes tests; challenging disregarded students who put their heads in the sand; and participating in workshops on Complex Instruction (a way of positioning students as experts in the classroom) for other teachers in the building.
ew in the moment and standing up for

they know that the goal is not to come
ario. They also know that they are not
son who is offering the scenario actu-
In My Shoes is that one must learn to
ter. Rather than going after every fight
ites. They need time to ponder which
With The Mirror Test, one cannot: stand
l things; one must have political clarity
portant in terms of advocating for stu-
run through one’s mind when looking
age of their career, need to consider
ge and the kind of language that would
assuming that PTs will figure that out
their school placements, we structure
se moves. Negotiating the local politics
ike other aspects of teaching that ben-
elping PTs learn to deal with politics in
ents while allowing them to keep their
of rehearsing.

ocimiento

grown in their political conocimiento is
licated ways with others (e.g., peers,
re like professionals who have a clear
ents who are pleasing their professor or
sing teacher does (Brown & McNama-
w PTs see teaching as a political act; al-
natics is political. By the end of the pro-
where they are required to follow blogs

definition of mathematics; create crit-
t teachers; and reflect on current events
ssments, and learning standards—
tics of teaching, and most demonstrate
en need to take a stand one way
able to look themselves in the mirror.
ave the level of sophistication that vet-
conocimiento would. Instead, I look for
ability to deconstruct competing mes-
athematics, and learning that circulate

in society; consideration of not just one-to-one interactions but historical, systemic, and institutional aspects of schooling that affect particular students; the propensity to take a stand, even if PTs are unsure what that will look like in practice; and a well-developed evidence base that can back their claims that they are putting students’ best interests first and supports their approach to teaching.

With respect to In My Shoes, in particular, I see growth when PTs are able to move from immediately suggesting actions to be taken—giving advice—to recognizing the importance of first gathering additional information and weighing the different kinds of approaches one could take. I also see growth when PTs are not just willing to consider more deeply the context of the situation and are able to offer viable actions for the teacher in the situation, but are willing to become the protagonist in the role-play.

Other signs of growth are making connections between a given political scenario and other scenarios they have faced once the group is debriefing a role-play. They might remark, “So, something similar happened to me last week in my school.” If PTs can make these connections and begin to do a meta-analysis—recognizing that two seemingly different scenarios have the same underlying theme—that will allow them to begin to understand larger discourses that operate in schools. Moreover, when they are able to bring new scenarios to the group regardless of how pleased or confident they felt in their response to that scenario, I see that they are moving beyond the idea that political situations have easy or correct answers. In some respects, I liken our teachers who are good at identifying these political situations to teachers who get good at identifying group-worthy problems (Horn, 2005). They develop a shared language and way of learning from and with each other that is meaningful and useful for teaching.

Partly as a result of various opportunities to develop political conocimiento and rehearsing for political situations through In My Shoes, the PTs with whom I have worked report doing a number of things in their schools to advocate for students. Some of these acts of creative insubordination occurred while they were student teachers and others once they had worked for a year or more. They include convincing others of the importance of taking a stand in a given situation and offering some viable ways to do it; organizing with other teachers in the building to challenge a principal who did not want to explicitly inform parents about their students’ rights to opt out of high-stakes tests; challenging a cooperating teacher who blatantly disregarded students who put their heads down on their desks and completed no mathematical work in class; offering professional development workshops on Complex Instruction (Featherstone, 2011) and other useful ways to position students as experts; and creating spaces (e.g., Google Hangouts) for other teachers in the region to share their specific struggles,
values, and approaches to deconstructing school policies and practices when they are not in the best interest of their students.

CONCLUSION

In doing this work, I have learned that teaching is about so much more than just planning for and carrying out instructional activities. In the same way that those teaching strategies that support emergent bilinguals and multilinguals tend to work well for other students, political conocimiento for teaching mathematics is critical for students who have been historically excluded or marginalized in mathematics, but such conocimiento is also helpful for all students. This kind of work is collaborative and intergenerational, meaning that the knowledge we create needs to be collaborative and in partnership with those who have come before us and will come after us. In our research group and in our interactions with PTs, we like to say, “We act ourselves into new ways of thinking, not vice-versa.” That is, it is not just work we think about and create philosophy statements about; this work is action-oriented.

The language and frameworks to which we expose PTs go a long way towards helping them make sense of the profession. In the same way they would plan for and deal with students’ conceptions of particular mathematical topics, they learn to recognize the politics and be able to plan for and deal with it when it arises. Moreover, it is not just what one learns in a teacher education program but actually how one learns that matters. If the forms of knowledge that we expect teachers to develop arise from habits of mind and actions that value tensions, rely on ethics, acknowledge politics, and are largely guided by what is in the best interest of students, this is modeling for them how they will do this work as lifelong learners. In other words, as I move forward in my career as a teacher, if I am learning through rehearsals and out-of-school spaces, if I am attending conferences and movies with veteran teachers and novices, if I am debriefing with others, it means that I am not going to expect to do this work on my own as a teacher. It also means that I am going to want to attend events with other people and debrief with other people. It means that I am not just going to look to textbooks or professors or peers for official knowledge, that I will continue to do this work in community with a diverse group of people, face-to-face and through blogs, social media, and using whatever means necessary.

The climate of high-stakes testing, new teacher evaluations, corporate America’s growing interest in education, and the dismantling of schools like Railside and Union High show us that teaching mathematics requires much more than learning how to develop inquiry-based lessons and assessments, or cultivating relationships with students, or having goals of ambitious teaching in ways that have been traditionally defined. We must prepare teachers to take a stand and think critically on issues of education. Prospective (and practicing) teachers need to understand the broader education identity, and power. They need to be able to see social justice issues within the world of education, and for us to not be afraid to point these issues out. As we move forward as a field, I ask the following questions: Can we use the Mirror Test as MTEs: By what standards do we measure success? Who or what will we look to in order to know if we are doing a good job in our teaching? Will we look at our reviews to decide we are excellent? Can we use a compass that can tell us we are not on track? What are the obstacles to gaining respect for students in the public schools, educators, colleagues, or PTs who feel they are not making a difference? Can we honestly say we are not part of the problem? Are we ready for a revolution in our education community has talked about for a long time? From the point of view of students, and the community in which they live, what do they think? Can we honestly say we are ready to be held accountable for our work?

NOTES

1. This research was funded by the National Science Foundation. Any opinions, findings, conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.
2. PARCC is not the only test with problems. The Common Core State Standards for Mathematics and the Smarter Balanced Assessment Consortium (SBAC) have also been criticized for their overemphasis on testing, standardized instruction, and a narrow conception of mathematics education. These tests prioritize procedural fluency over conceptual understanding, which has led to complaints from many teachers and mathematicians. Some critics argue that these tests are not aligned with the aims of mathematics education, which should be focused on cultivating students' mathematical thinking and problem-solving abilities. Furthermore, these tests have been accused of perpetuating disparities in educational outcomes, as they may be more difficult for students from disadvantaged backgrounds.
3. I use the term Latin@/x to indicate someone who identifies as Latin@/x, which includes individuals who identify as Latin@ or Latinx. Latin@ and Latinx are terms that are gaining popularity in the United States as alternatives to the term Spanish-speaking. They are intended to be inclusive of individuals who speak Spanish as a first language and who identify as Latin@/x, regardless of their national origin or cultural background. This approach recognizes that the term Spanish-speaking does not capture the diversity of languages and identities in the United States.
4. I cite this article as 2010/2015 because it was published in 2010 and some researchers began to use the term Latin@/x in 2015.
school policies and practices

is about so much more than

In the same way

mergent bilinguals and multi-

political conocimiento for teach-

have been historically excluded

conocimiento is also helpful for all

d intergenerational, meaning

laborative and in partnership

come after us. In our research

e to say, “We act ourselves into

it, it is not just work we think

it, this work is action-oriented.

we expose PTs go a long way

fession. In the same way they

ptions of particular mathematic-
s and be able to plan for and

just what one learns in a teach-

arms that matters. If the forms

lop arise from habits of mind

es, acknowledge politics, and

st of students, this is modeling

learners. In other words, as I

learning through rehearsals

ferences and movies with vet-

with others, it means that I am

am as a teacher. It also means

other people and debrief with

g to look to textbooks or pro-

will continue to do this work in

ce-to-face and through blogs,

essay.

eaker evaluations, corporate

d the dismantling of schools

taching mathematics requires

quiry-based lessons and as-

s, or having goals of

aditionally defined. We must

prepare teachers to take a stand and to reclaim the profession of mathemat-

ics education. Prospective (and practicing) teachers need opportunities to

understand the broader education landscape as it relates to capital, iden-
tity, and power. They need to be able to deconstruct the messages that so-
ciety sends to us about what is important in learning, teaching, and justice.

As we move forward as a field, I ask us to think hard about what is our

Mirror Test as MTEs: By what standards will we judge ourselves to be excel-

ent? Who or what will we look to in order to decide if we are really doing a

good job in our teaching? Will we look externally to promotion and tenure

reviews to decide we are excellent? Or will we have developed an internal

compass that can tell us we are consistent with our ethics and what is best

for students in the public schools, even if that means standing up to ad-

ministrators, colleagues, or PTs who feel more comfortable maintaining the

status quo? Can we honestly say we are preparing beginning teachers for the

realities they will face if we ignore politics? For a long time, the mathematics

education community has talked about equity, about a kind of “mathematics

for all.” From the point of view of students who are Black, Latin@/x, Ameri-
can Indian, recent immigrants, emergent bilinguals or multilinguals, or his-

orically looted, if we do not prepare our teachers for the political nature of

tematics teaching, then we are doing little more than rearranging the

airs on the deck of the Titanic.

NOTES

1. This research was funded by the National Science Foundation, Grant # 0934901. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation. Thank you to the teachers who so graciously shared their teaching struggles and accomplishments with me. Research assistants include Sonya E. Irving, Juan Manuel Gerardo, and Gabriela E. Vargas.

2. PARCC is not the only test with problems. Smarter Balanced tests also have been found to have egregious flaws (Heitin, 2015).

3. I use the term Latin@/x to indicate solidarity with individuals who identify as 

lesbian, gay, bisexual, transgender, questioning, and queer (LGBTQ). Both Latin@ and Latinx represent a decentering of the patriarchal nature of the 

Spanish language whereby groups of males and females are normally referred to with the “o” (male) ending as well as a rejection of the gender binary. For 

some, the circular line radiating outward represents gender fluidity; for others, the “x” represents a variable whereby any gender form could be repre-

sented. My choice to use this term reflects my respect for how people choose to 

tame themselves.

4. I cite this article as 2010/2013 because it was published online through JRME in 2010 and some researchers began citing it as such then. It was not released
in print in JRME until 2013, and some researchers have cited it as such since. Because the focus of the article is on a particular point in history, the work should reflect the earlier date.

5. I use the term *historically rooted* to emphasize the fact that certain students and their families are not just “low income.” They have not been able to accrue wealth because others have stolen that wealth from them. See, for example, Madrigal (2014) for the inconsistent ways in which the Federal Housing Administration loans were distributed to citizens who were Black or White. See Weinberg (2003) for a brief history on how American Indians, Blacks, and poor Whites have been exploited for their labor.

REFERENCES


some researchers have cited it as such since. is on a particular point in history, the work emphasize the fact that certain students and outcomes. They have not been able to accrue that wealth from them. See, for example, tent ways in which the Federal Housing Ad joined to citizens who were Black or White. See story on how American Indians, Blacks, and for their labor.

REFERENCES


Gutierrez, R. (2013a). Mathematics teachers using creative insubordination to advocate for student understanding and robust mathematical identities. In M. Martinez & A. Castro Superfine (Eds.), Proceedings of the 35th annual meeting of the


at the test: A problem with the Common
from https://www.nytimes.com
f (1997). Ethnomathematics: Challenging Eu-
Albany: State University of New York Press.
prove, English marks drop on state PARCC
om http://www.chicagotribune.com:
abic school teachers slackers or dedicated
Retrieved from http://thesoutherncom
). Charter schools: A map of failure and m
a-map-of-failure-and-a-money-vortex/
stand: Knowledge growth in teaching. Edu-
education can run, but it cannot hide. The
ge://www.huffingtonpost.com/alan-singer/
566.html
Critical postmodern methodology in math-
oting another way of thinking and looking,
journal [25th Anniversary Issue], 23, 1–18.
wrong answer—and why it matters in the
onitoring social media for security breach-
 resilience. The Atlantic. Retrieved from
Palomar, J. (2011). Latina/o Bilingual El-
citgate Problems Grounded in Community
dich, & M. Civil (Eds.), Latino/as and math-
ing and teaching in classrooms and communities
formation Age.
nt. "With math, it's like you have more de-
trowding at their school. In E. Gutstein & B.
matics: Teaching social justice by the numbers
inking Schools.
Researching the socio-political dimensions of math-
ent letter to Chancellor Dennis Wakcott and
Retrieved from http://thejosevilson.com/
akkott-and-others-on-the-idea-of-assessment/
reason: Cognitive development and production of
uteledge.
t on gender research: What do you do when
end of the light? Journal for Research in Math-