
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



INFORMATION AGE PUBLISHING, INC.

Charlotte, NC • www.infoagepub.com

Library of Congress Cataloging-in-Publication Data

Names: Kastberg, Signe E., 1963- editor.

Title: Building support for scholarly practices in mathematics methods /
edited by Signe E. Kastberg, Purdue University [and three others].

Description: Charlotte, NC : Information Age Publishing, Inc., [2017] |

Series: Association of Mathematics Teacher Educators (AMTE) professional
book series | Includes bibliographical references.

Identifiers: LCCN 2017035865 (print) | LCCN 2017043159 (ebook) | ISBN
9781641130271 (E-book) | ISBN 9781641130257 (pbk.) | ISBN 9781641130264
(hardcover)

Subjects: LCSH: Mathematics teachers--Training of. | Mathematics--Study and
teaching.

Classification: LCC QA11.2 (ebook) | LCC QA11.2 .B8674 2017 (print) | DDC
510.712--dc23

LC record available at <https://lcn.loc.gov/2017035865>

*For mathematicians
whose creativity
inspires scholarship
in mathematics*

Cover photo provided by University of Washington College of Education

Copyright © 2018 Information Age Publishing Inc.

All rights reserved. No part of this publication may be reproduced, stored in a
retrieval system, or transmitted, in any form or by any means, electronic, mechanical,
photocopying, microfilming, recording or otherwise, without written permission
from the publisher.

Printed in the United States of America

the *Psychology of Mathematics Education* (pp. 1-10).
an State University.
arlet: *A theory of mathematical knowledge in*
ernational Congress on Mathematics Edu-
from <http://tsg.icme11.org/document/>

Lischka, A. (2015). *Scholarly inquiry and*
ics education methods. Atlanta, GA: National

(1978). *Science, curriculum, and liberal educa-*
versity of Chicago Press.

study: A structured look at mathematics
t, 16(1), 12-15.

oice: Concepts, methodology, and use for
ith Education & Behavior, 24(3), 369-387.

ary). *What really should be taught in the ele-*
ted at the Annual meeting of the Associa-
tors, Chicago, IL. Retrieved from <http://>
pdf

CHAPTER 2

POLITICAL CONOCIMIENTO FOR TEACHING MATHEMATICS

Why Teachers Need It and How to Develop It¹

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 schools, to create 260 new schools in the next 7 years, and to launch a campaign that will get families and teachers to support that charter schools are the next great thing. The Broad and Melinda Gates Foundation, as well as other interests in public education. The effort intensify with the multimillionaire Bettino Craxi's movement, as the new Secretary of Education. Corporations like Pearson have capitalized on student assessments and standardized tests (Persson, 2015). With teachers' dependence on student test scores, Pearson is allowed to stay in the profession.

Corporations are making huge profits from new ways of assessing them, yet the benefits, particular, are not so clear. The Common Core Standards, more than the *Adding It Up* report (National Academy of Sciences with the National Council for Teachers of Mathematics and Standards for School Mathematics), had in our professional community. The new standards are a move away from the "evidence-based" components of previous standards (NCTM, 2000). The equity position statement (NCTM, 2000) connects mathematics with students' lives. It has been the focus of more NCTM presentations (Gojak, 2012), yet there is no mention of the Standards, and accommodations for students with disabilities are in an appendix, something only the teachers' union would support.

Content-specific education professional development for prospective teachers (PTs) and help for a teacher. Now, for-profit corporations like Pearson, states and the District of Columbia have implemented a performance assessment managed by Pearson. Teachers pay \$300 to upload evidence of planning and teaching. In hopes of being positively evaluated in the process, they are required to document their work in schools where they are student teachers. The corporation that is seeking to market its product to them. So, in some ways, our PTs have become a for-profit corporation.

It is not always easy for PTs to understand the sides of new reforms. Take, for example, the Ready for College and Careers (RCC) initiative.

who historically have been excluded from knowledge of content, pedagogy, and student success. Politics get in the way, their profession.

With as much skill and practice in dealing as they were with lesson planning, assessment, classroom management, connecting to students. Instead of just carrying on have been in place for years, they are in the best interest of students. Change in dialogue and influence others than stand by while new policies are in use of justice, they might advocate for perhaps more talented teachers might. In this chapter, I will argue (a) mathematics teachers need political knowledge, (b) to develop political knowledge with (c) and (d) when mathematics teachers deal with the politics of teaching, and (e) their practice.

TEACHING MATHEMATICS

But we seem to be at an extreme where committed individuals reconsidering the kinds of people they wanted to hire (Natale, 2014). As teachers are given professional judgment, even award-winning teachers' generation of students to rethink teaching. Private and charter schools may be able to ask poor-performing students to leave their doors if their school is no longer (5). Public school teachers know they are kicked through their doors. As such, part of the narrative to stories of students not on the view that teachers are slackers

and billionaires with no expertise in schools. In 2015, Eli Broad and his foundation 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 downsides 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.² 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 (Kamenetz, 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
terman, 2011; Phillips, 2014). Califor
mon Core. PARCC and Smarter Bal
U.S. Department of Education. Ther
or delays in reporting scores, design
for testing, and untimely reporting c
not only teacher's salaries but also
next level of schooling. For-profit co
tests used to decide who stays in teac
in the first place (e.g., edTPA) and a
through this process. Pearson's EnV
generate claims of impact and general
while grossing a minimum of \$320
with a potential revenue stream of \$2
Race to the Top money, charter scho
and other charter schools play by th
tions Academy, a group of virtual ch
age new standards and new product
Pearson places gag rules in test cont
questions about the tests. Pearson h
cial media to stop testing leaks (Stra
mathematics and reading language a
than aspiring lawyers who sit for the l
return. Pearson was implicated in ar
practices in a \$1.3 billion deal to pro
in the Los Angeles Unified School D

Fortunately, there is a movement
teachers, students, and journalists wh
cation that move beyond testing and
and the attacks on public education.
providing a picture of what is happer
in the past decade, we have had nea
ceived a total of \$3.7 billion in fede
opened their doors (Persson, 2015).

As the influence of corporate Ame
forces with others to reclaim this pro
that education should give up all tes
derstand which populations of studer
system and which are not. Rather, in
internet such as Fair Test, Change th
Schools, Creating Balance in an Unjus
for Social Justice, TODOS Mathemat
are fighting for a definition of educa

and growth. The PARCC test seeks to national standard and holding schools making it easier for parents anywhere level of their students, regardless of the reside. There are many upsides to enstandards, as some fear our nation relies (Lingit & St. George, 2016). However, the PARCC test was never normed requiring states to use it, the test is not a me educators have argued that schools e tests on the backs of their students e relinquishing upwards of 6 weeks of The first set of scores received by stu-ifying the need for states and districts m Pearson to raise those scores. The s for students, little useful information arning, and more profit for corpora-review committee at the high school Pearson officials in 2013 about consis- the nation and what this meant for son could not be held accountable for tors made or what the public did with le who make the tests." Their goal at eplace the ACT so that they would gain o some extent, their goal is already be- e, Kentucky, New Jersey, and Colorado n decisions and entry-level credit for Illinois has recently stopped using the s are still spending millions of dollars CC testing. Where corporations might adoption, now they are poised to gain eover, Pearson has recently expanded hilippines with Affordable Private Edu-ools (Kamenetz, 2016) and intends to nts 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- f 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 (Otterman, 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 exaggerate claims of impact and generalizability to students of all ability levels, while grossing a minimum of \$320 million per year on this one 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 group 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 education 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 understand 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

...taking matters into their own hands
...formation 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 (Goose-
...orth, 2015; Vilson, 2012).

...ybody, inner-city schools that lack the
...out newer assessments or whose stu-
...arning goals based on new standards
...TPA and its associated text-heavy forms
...g or preventing individuals whose first
...ng teaching. Given such politics, it is
...e to recruit and retain a large cadre
...sion. Regardless of where they work,
...ors (MTEs) alike will need support to
...political context of mathematics teach-
...e informed decisions about their work
...Educators [AMTE], 2017).

Political

...ics relate to mathematics education in
...schools—Railside and Union. Railside
...o noted for its success in mathematics
...searchers (Boaler, 2006; Boaler & Sta-
...sir, Cabana, Shreve, Woodbury, & Lou-
...ago, also noted for its success (Gutiér-
...s serve low-income, largely Latin@/x³
...who underwent extensive professional
...conceptual understanding over mere
...artmental community that held a com-
...ommitment to all students; both have
...ogram (Alper, Fendel, Fraser, & Resek,
...ess. Their students have demonstrated
...defend their arguments publicly, at-
...in other schools, demonstrated higher
...produced a unimodal distribution of
...different backgrounds. Students have
...er percentage of students took calcu-
...union in the 1998–1999 school year).
...high 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 judgments 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 technical 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 something about mathematics as a discipline that is political? A number of researchers across the globe have begun to highlight the ways in which knowledge, power, and identity are interwoven with mathematics, something called the “sociopolitical turn” (Gutiérrez, 2010/2013;⁴ Stinson & Bullock, 2015). Early examples that highlighted how power, identity, and knowledge relate to teaching, learning, and teacher education named these as “sociopolitical 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 enculturation as their goal, whereas sociopolitical dimensions concern themselves with emancipation. In writing about the sociopolitical turn, I chose not to hyphenate the word because I did not believe the social (issues of identity in particular) and the political (issues of power in particular) could be extracted 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 mathematics brings are important for MTEs to consider. On many levels, mathematics 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.

All Mathematics Teachers Need to Be Successful

When we acknowledge a sociopolitical context for teacher education, it raises questions about what knowledge and skills they need. Many teachers develop "ambitious" teaching practices but are not rewarded for their efforts and their success. Cases of Union and Railside High, the Response to Intervention model, and the latest packaged reforms can be seen as the best interest of our students and the best interest of teachers to become professionals. The question is whether PTs can successfully develop their students, or public education (Guggenheim & Kimball, 2010) or W. Nor can the edTPA identify teachers' success. Reform movements like "growth mindset" and movies and reforms address equity by focusing on the best interests of our students. However, the savvy educator understands the best interests of charter schools and the idea that public schools need a better model. We can realize that growth mindset and growth mindset for students, situate the problem of teacher education and ignore broader institutional issues. We are unable to deconstruct the deficit model of ourselves, their students, or public education. We advocate for policies and practices that

The majority of professional development for teachers receive from teacher education programs. Professional societies like NCTM do not focus on or negotiate the politics they regularly face. Advances in such things as how to approach language to build upon the linguistic and cultural context of the school, most programs in teacher education are based on the same set of assumptions about the knowledge of mathematics need, which were developed in the 1960s. We call it pedagogical content knowledge (PCK) and it is the knowledge for teaching (Hill et al., 2005). We come fluent in content knowledge, but we are not fluent in the edge of students.

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

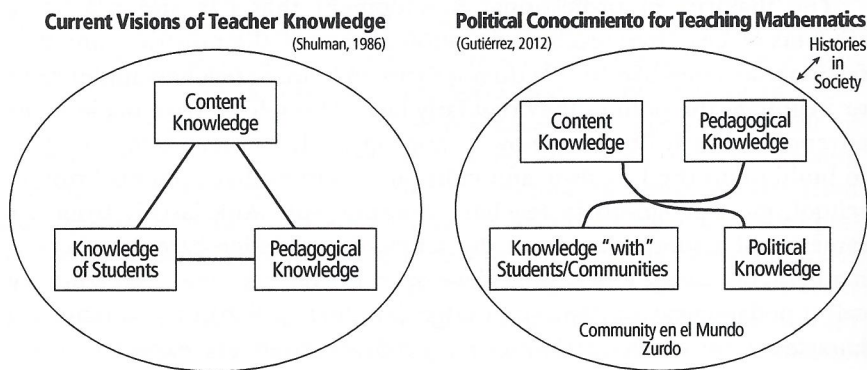


Figure 2.1 Teacher knowledge.

objectified way (Gutiérrez, 2009) but committed to being interdependent not as individual teachers but in a term *el mundo zurdo* recognizes this solidarity among people of color, physically challenged, and resisting (Anzaldúa, 1981). The presence of that mathematics has been and is being out the world. We are in a particular modern mathematics, but in terms of mathematics and education today.

PTs who have developed political knowledge that helps them deconstruct deficit teachers, or public education—are built around them and to use their professions about the kinds of learning opportunities the benefits of using achievement data being served well by the school system defining equity around such things as understand that, more than just getting same on tests of achievement, we should come the kinds of people they want to for themselves, which can mean different (2002b). Teachers with political *conocimiento* when outside entities come in and tell kids” or that we need to develop a “growth” are telling students that it is really important and grit or grow new dendrites to stacked against them, is that really a human the point of view of students of color and that just sound like a new version of “When PTs and practicing teachers lack knowingly adopt simplistic reform packages feel they are effectively addressing equity

Creative Insubordination

When PTs are developing political knowledge do something to address the injustices of subordination comes into play. *Creative* the 1980s, a term I heard growing up on a regular basis in my community. I later

KNOWLEDGE FOR TEACHING

knowledge—political knowledge for as *political conocimiento*, and I explain other papers (Gutiérrez, 2012, 2013b). There is that although the Spanish term *conocimiento* in English, I am borrowing a version of it that all knowledge is relational. They must be known subjectively. This is the way, “Do you know that restaurant?” It is not to be a universal objective set of facts. The relationship with that restaurant: Are there any connections you have with it? Your knowledge is the knowledge that others have of it, but it also poses, key features of *conocimiento* are its relationality and interdependence.

Political conocimiento is the kind of knowledge that helps you negotiate the world of high-stakes testing and connect and explain your mathematics to officials. It buffers you from a system of standardized systems so that you can be an advocate. *Political conocimiento* is the kind of knowledge that permeates everything we do, in education, in particular, and affects how we are connected to the world. We might envision a different, more

different versus other models is the idea that communities, not knowledge of them or for them, “know” students not in some kind of

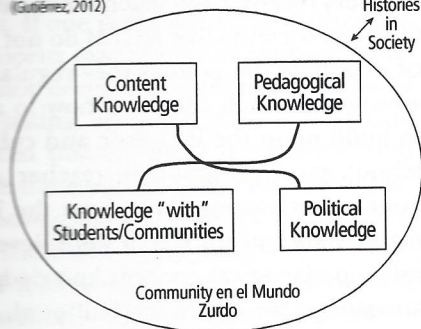
objectified way (Gutiérrez, 2009) but rather by standing alongside them, committed to being interdependent with them. All of this work is done not as individual teachers but in a supportive community with others. The term *el mundo zurdo* recognizes this community as the left-handed world of solidarity 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,⁵ 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

Political Conocimiento for Teaching Mathematics
(Gutiérrez, 2012)



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, 2013a, 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,

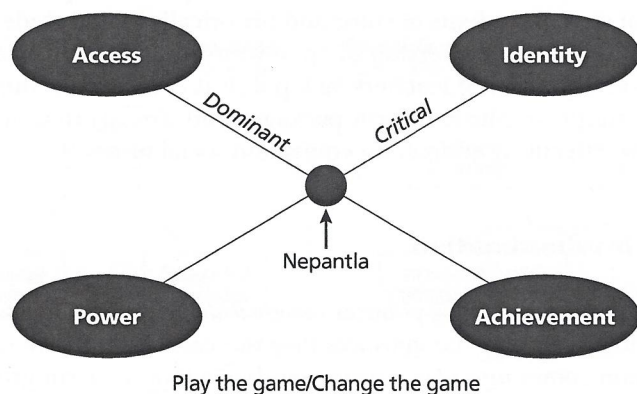


Figure 2.2 Dimensions of equity/learning.

achievement, identity, and power (Gutiérrez, 2006). I identify particular scenarios as being political (Gutiérrez, 2006).

In doing so, they come to recognize that in our work as mathematics teachers, our work can remain neat and tidy, but it can also be messy. That is, our work can remain neat and tidy for teachers, administrators, and policymakers as well as the students. If we adhere to a mainstream definition of equity, we can only have access (e.g., students having access to quality teachers and rigorous learning experiences) (e.g., equal outcomes on standardized tests, equal representation in advanced courses taken, equal representation in advanced courses taken). We refer to collectively as the *dominant* definition of equity. The beliefs held by most educators, parents, and policymakers. We ask ourselves, is this definition of equity a good one? Does this definition of equity make sense if we consider the kinds of identities that students bring to the classroom? Does this definition of equity make sense if we see students as legitimate participants in mathematics? Does this definition of equity make sense if we consider the "standard algorithm" or speak English? Does this definition of equity make sense if we consider the historical and cultural aspects of mathematics? Does this definition of equity encourage teachers to be used as a lens to identify inequities in one's home community? Does this definition of equity make sense if we consider students getting good grades and access to advanced courses?

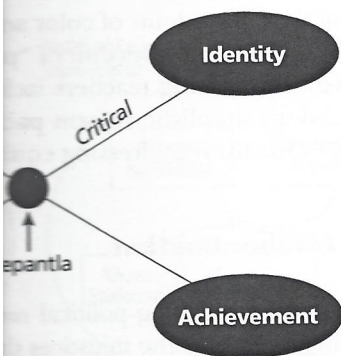
What I aim for in my teacher education program is to get away asking themselves, "For any given scenario, what is the definition of equity? When given the opportunity to think about equity, what definitions of equity are circulating in society and in the classroom? How do we understand the importance of identity in the classroom? How do we understand the importance of identity in a critique of the status quo? This is a critical question. This is a question from students' perspectives. Whenever we talk about equity, we need to ask, "equity for what purpose and from whose perspective?"

The four dimensions of equity/learning provide a space for playing space. Rather than being a definition of equity, the four dimensions provide language for playing space. The four dimensions provide language for playing space that arise in the teaching of mathematics for all, closing the achievement gap, and capturing the language of equity. This language also helps PTs to involve helping students to "play the game" of standardized tests and develop proficiency in Mathematical Practice (National Governor's Association, 2010).

al leadership because some principals
shment to protect their teachers when
t seem fair (Crowson & Morris, 1985). I
he work that community leaders and ex-
their everyday practice (Gutiérrez, 2013a,
13; Gutiérrez, Irving, & Gerardo, 2013).
innovative work that individuals, in col-
eed 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 oth-
them to do, they reflect deeply and base
ent guided by doing right by students.
light the fact that this work is not done
that keeps teachers from being fired. In
knowledge, it requires skill and precision.

an Develop

mathematics teachers need to be able to rein-
n PTs enter classrooms for observation
rong messages that equity is about the
rowth mindset; equity is about grit and
those sites, I try to help them grapple
equity. I present for them four dimen-
(2) that they should consider: access,



Change the game

ning.

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 be *conocimiento* is to offer opportunities for the tensions of equity, learning, and mathematics in a language for talking about mathematics to question the status quo in ways that status quo in schools where they may v

Conceptual Framework

Elsewhere, I have described how a program that allows us to support teachers’ *conocimiento* with each other (Gutiérrez, 2007). Figure 2.3 shows some of the key structural components of our model.

This is our tapestry weave framework. It includes certain structural components—seminars, professional development sessions, and mentoring—that support the kinds of creating and challenging knowledge, developing

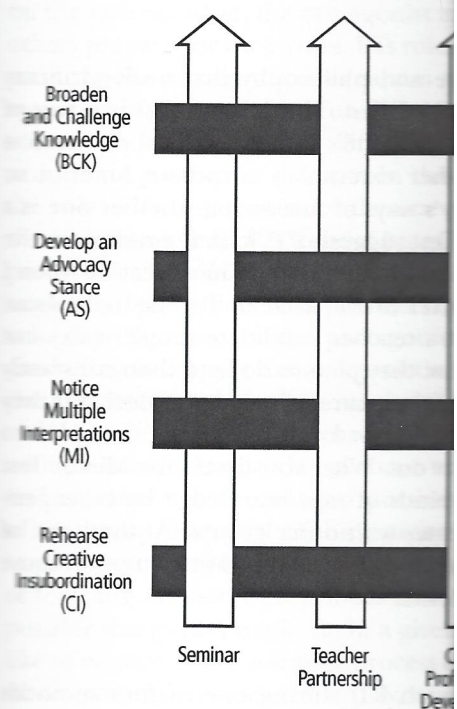


Figure 2.3. Conceptual framework for teaching mathematics.

ardly of not having all options open in potential. The goal would be to attend to decide their own futures rather than for them. But another part of teaching may be "the game"—supporting students' identities at odds with things like scoring well on tests to change the game may arise by changing the rules (Esmonde, 2014; Gregson, 2013; Chun, 2005) or assigning projects that challenge home communities (Aguirre, Zavala, & Diez-Palmar, 2011). It could be, as teachers, relate with mathematics may require us to use our own sense of what is possible in our school or district. Changing the ways of preparing students to do so, teachers are becoming the kinds of people they aim to be and more humane version of the activity. People with these cross-cutting goals, but at their stance. What are they willing to do for the sake of social justice will they use, and how? A sophisticated definition of equity is to know she is achieving it without

is the concept of *Nepantla*, a form of being in a space of tensions but from a kind of interacting in the world that recognizes and maintains those tensions rather than trying to resolve them (Anzaldúa, 1987; Anzaldúa & Keating, 2002). It is about thinking of dealing with opposing views. In this dissonance, the psychological discomfort of holding two viable but seemingly irreconcilable positions. They are able to value the idea that cognitive dissonance is to eliminate the tension between two different ways of seeing the world. With *Nepantla*, we want to become comfortable with the tension between the old and the new knowledge.

helps me to help PTs grapple with important issues in mathematics, it allows them to recognize that learning to play the game will involve helping students to play the game. Teachers, will need to be able to do so. MTEs will need to learn how to play the game. 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 multiple interpretations, and rehearsing creative insubordination, developing an advocacy stance, noticing

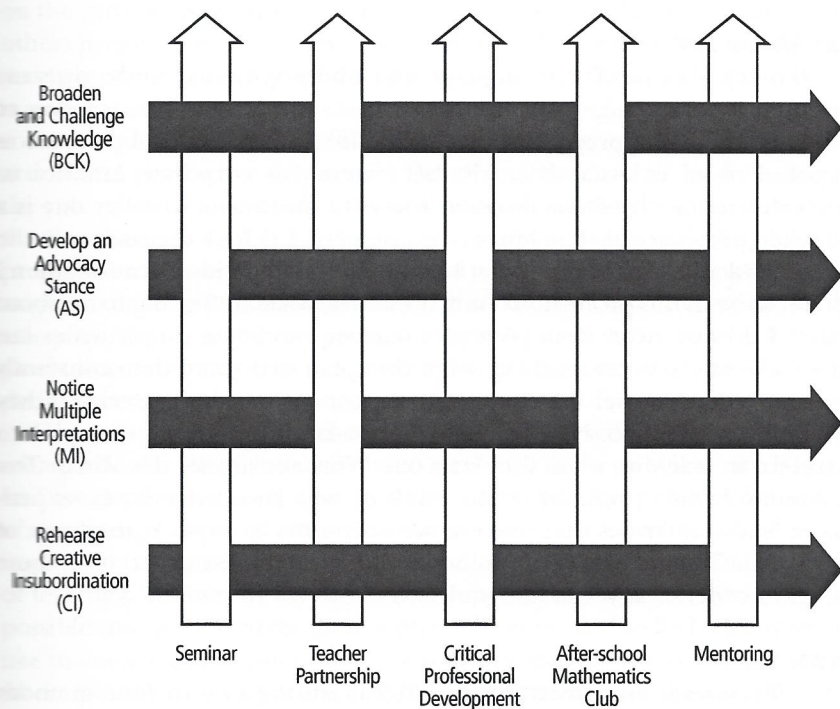


Figure 2.3. Conceptual framework for teacher education.

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 *Nepantler@* (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,

Gerardo, and Vargas (see Chapter 10). A leader (a practicing teacher, student leader) presents a situation in which they found themselves. The situation could be a new policy that is being implemented or a new textbook adoption that is in the interests in mind. It could be hearing a complaint about a more rigorous curriculum” or “she’s not helping me just because I’m not.” The leader is asking the group, “What would you do?”

After a scenario is raised with the group, a role-play ensue. PTs discuss the situation with the teacher leader who presented the scenario, revealing the response to that scenario. The teacher leader presents back to the group the list of possible actions. Next PTs identify, partly upon consensus, which action seems most worthy of taking. The action with the idea in mind that it will be the most effective. A member of the group volunteers or is designated (protagonist) in the scenario. The role of the protagonist on the rare occasion, the protagonist may be the teacher. Others prepare for their roles. PTs role-play, acting as the protagonist who carries out the action. Other members of the group take on different roles, including advocates who aim to make it difficult for the protagonist to act in a productive manner. In this role-play, the role of the antagonist, or the one who opposes the protagonist, is in the first place. Next, PTs debrief how the protagonist felt about their actions and how they might do differently. Other members of the group role-play they thought the protagonist should do (including actions by the antagonist or the protagonist). The entire process can take 10–15 minutes.

Unlike other kinds of rehearsals that focus on a particular thing to learn about teaching, this activity is and are dependent on the perspective of the group. The goal of this activity is to rehearse important or even likely scenarios that may arise in the practice of teaching. Rather, *In My Shoes* is an activity that allows possible things they might do in a given situation. PTs are like to engage in the complex process of teaching where power dynamics are at play, where they are with their points of view. More importantly, it is a practice responding in a strategic manner.

ing for creative insubordination are all
 op as they move through the program.
 eadings and reflections. The structural
 or the conceptual components to take
 ine and provide support for each other
 olves becoming a *Nepantler@* (one who
 and also becoming the “other” (one
 aging with youth in nonschool settings
 el creative insubordination, and it will
 political encounters that they will face
 hat no single activity or aspect of the
 achers to develop political *conocimiento*.
 y of situations and course assignments
 seriously the idea that being a profes-
 judgments in connection with others;
 al clarity, a commitment to ethics; and
 ensible to parents, students, and other
 which teachers will be able to carry out
 ure work environments.

e and philosophy that undergirds my
 rror 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
 Test 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
 f their career in order to decide if they
 s do not know everything they plan to
 t out. What constitutes the Mirror Test
 kinds of new knowledge bases, experi-
 ates 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 insubordina-
 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 that 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 that look like in practice; and a well-developed claims that they are putting student approach to teaching.

With respect to *In My Shoes*, in being able to move from immediately suggesting a vice—to recognizing the importance of negotiation and weighing the different kinds of growth when PTs are not just will text of the situation and are able to be 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 a meta-analysis—recognizing that two same underlying theme—that will all discourses that operate in schools. Many new scenarios to the group regardless in their response to that scenario, I have an idea that political situations have easy. I liken our teachers who are good at to teachers who get good at identifying. They develop a shared language and other that is meaningful and useful for

Partly as a result of various opportunities and rehearsing for political situations whom I have worked report doing a advocate for students. Some of these occurred while they were student teachers for a year or more. They include coming taking a stand in a given situation and organizing with other teachers in the did not want to explicitly inform parents out of high-stakes tests; challenging disregarded students who put their completed no mathematical work in class workshops on Complex Instruction (ful ways to position students as experienced Hangouts) for other teachers in the re

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
attles. They need time to ponder which
With The Mirror Test, one cannot stand
l things; one must have political clarity
important in terms of advocating for stu-
run through one's mind when looking
stage of their career; need to consider
e and the kind of language that would
n assuming that PTs will figure that out
a their school placements, we structure
e moves. Negotiating the local politics
like other aspects of teaching that ben-
helping PTs learn to deal with politics in
ents while allowing them to keep their
of rehearsing.

conocimiento

e grown in their political *conocimiento* is
simplified ways with others (e.g., peers,
re like professionals who have a clear
ents who are pleasing their professor or
ating teacher does (Brown & McNama-
w PTs see teaching as a political act; al-
matics is political. By the end of the pro-
where they are required to follow blogs
definition of mathematics; create criti-
teachers; and reflect on current events
assessments, and learning standards—
ics of teaching, and most demonstrate
often need to take a stand one way
able to look themselves in the mirror.
have 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 t
ics education. Prospective (and pract
understand the broader education b
tity, and power. They need to be able
ciety sends to us about what is impor

As we move forward as a field, I
Mirror Test as MTEs: By what standar
lent? Who or what will we look to in o
good job in our teaching? Will we loo
reviews to decide we are excellent? C
compass that can tell us we are consi
for students in the public schools, ev
ministrators, colleagues, or PTs who fe
status quo? Can we honestly say we are
realities they will face if we ignore poli
education community has talked abou
for all." From the point of view of stud
can Indian, recent immigrants, emerg
torically looted, if we do not prepare o
mathematics teaching, then we are do
chairs on the deck of the *Titanic*.

NOT

1. This research was funded by the 0934901. Any opinions, findings, and conclusions expressed in this material are those of the author and not necessarily the views of the National Science Foundation. I would like to thank so graciously shared their teaching research. Research assistants include Sonya E. Ibarra and E. Vargas.
2. PARCC is not the only test with problems. It has been found to have egregious flaws (see, e.g., www.parc.org).
3. I use the term Latin@/x to indicate a more inclusive language for lesbian, gay, bisexual, transgender, and queer people. Latin@ and Latinx represent a decent way to use the Spanish language whereby groups of people end with the "o" (male) ending as well as the "a" (female) ending. In some cases, the circular line radiating out from the "o" represents a variable which is not represented. My choice to use this term represents a way to name themselves.
4. I cite this article as 2010/2013 because it was published in 2010 and some researchers began c

school policies and practices
students.

g is about so much more than
nal activities. In the same way
emergent bilinguals and multi-
political *conocimiento* for teach-
ve 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
t, it is not just work we think
t; this work is action-oriented.
we expose PTs go a long way
fession. In the same way they
otions of particular mathemat-
s and be able to plan for and
ust *what* one learns in a teach-
arns that matters. If the forms
lop arise from habits of mind
cs, acknowledge politics, and
st of students, this is modeling
g learners. In other words, as I
n learning through rehearsals
ferences and movies with vet-
with others, it means that I am
wn 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
ace-to-face and through blogs,
ssary.
teacher evaluations, corporate
d the dismantling of schools
teaching mathematics requires
inquiry-based lessons and as-
students, or having goals of
raditionally defined. We must

prepare teachers to take a stand and to reclaim the profession of mathematics education. Prospective (and practicing) teachers need opportunities to understand the broader education landscape as it relates to capital, identity, and power. They need to be able to deconstruct the messages that society 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 excellent? 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 administrators, 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, American Indian, recent immigrants, emergent bilinguals or multilinguals, or historically looted, if we do not prepare our teachers for the political nature of mathematics teaching, then we are doing little more than rearranging the chairs 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 represented. My choice to use this term reflects my respect for how people choose to name 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 looted* 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

- Aguirre, J., Zavala, M. R., & Katanyoutant, T. (2012). Developing robust forms of pre-service teachers' pedagogical content knowledge through culturally responsive mathematics teaching analysis. *Mathematics Teacher Education and Development*, 14(2), 113–136.
- Alper, L., Fendel, D., Fraser, S., & Resek, D. (1997). *Interactive mathematics program, year 1*. Emeryville, CA: Key Curriculum.
- Anzaldúa, G. (1987). *Borderlands/La Frontera: The new mestiza*. San Francisco, CA: Aunt Lute Books.
- Anzaldúa, G., & Keating, A. L. (2002). *This bridge we call home: Radical visions for transformation*. New York, NY: Routledge.
- Association of Mathematics Teacher Educators. (2017). *AMTE standards for mathematics teacher preparation*. Raleigh, NC: Author.
- Balingit, M., & St. George, D. (2016, July 5). Is it becoming too hard to fail? Schools are shifting toward no-zero grading policies. *The Washington Post*. Retrieved from <http://www.washingtonpost.com>
- Barnes, D. (director, writer), & Hill, B. (writer). (2012). *Won't back down*. USA: 20th Century Fox Film Corporation.
- Blume, H. (2015, September 30). Backers want half of LAUSD students in charter schools in eight years report says. *Los Angeles Times*. Retrieved from <http://www.latimes.com>
- Boaler, J. (2006). How a detracked mathematics approach promoted respect, responsibility, and high achievement. *Theory Into Practice*, 45, 40–46.
- Boaler, J., & Staples, M. (2008). Creating mathematical future through an equitable teaching approach. *Teachers' College Record*, 110, 608–645.
- Brown, T., & McNamara, O. (2005). *New teacher identity and regulative government: The discursive formation of primary mathematics teacher education*. New York, NY: Springer.
- Chronaki, A. (1999) Contrasting the “socio-cultural” and “socio-political” perspectives in maths education and exploring their implications for teacher education, *European Educational Researcher*, 5, 13–20.
- Crowson, R. L., & Morris, V. C. (1985). Administrative control in large-city school systems: An investigation in Chicago. *Educational Administration Quarterly*, 21, 51–70.
- Esmonde, I. (2014). “Nobody's rich and actually not”: Affluent students le *nal of the Learning Sciences*, 23(3).
- Featherstone, H. (2011). *Smarter together rooms*. Reston, VA: National Coun
- Festinger, L. (1957). *A theory of cognitio* sity Press.
- Gaines, L. (2015). Evanston Township weighs in on PARCC. *Chicago Tri* tribune.com
- Gojak, L. M. (2012, June 5). Let's kee *cil of Teachers of Mathematics S* nctm.org/News-and-Calendar/ Linda-M_-Gojak/Let_s-Keep-Equi
- Goosetree. (2015, March 2). To PARCC *mrsgoostree.weebly.com/blog/to*
- Gregson, S. A. (2013). Negotiating socia *tion*, 44(1), 164–198.
- Guggenheim, D. (writer, director), & Kin 29). *Waiting for Superman*. USA: Pa
- Gutiérrez, R. (1999). Advancing Urban *from an effective high school ma* 31(3), 263–281.
- Gutiérrez, R. (2002a). Beyond essentialis *Latina/o students mathematics. A* 1047–1088.
- Gutiérrez, R. (2002b). Enabling the pra *Towards a new equity research age* 4(2&3), 145–187.
- Gutiérrez, R. (2006). *How would you clas* ment activity used in the secondary *at the University of Illinois at Urban*
- Gutiérrez, R. (2007). Context matters: Eq *ics education*. In Lamberg, T., & V *annual meeting of the North America* *Psychology of Mathematics Education* (vada, Reno.
- Gutiérrez, R. (2009). Embracing the inh *from an equity stance. Democracy an*
- Gutiérrez, R. (2010/2013). The sociopoli *nal for Research in Mathematics Educa*
- Gutiérrez, R. (2012). Embracing “Nepan *teaching. REDIMAT- Journal of Resea*
- Gutiérrez, R. (2013a). Mathematics teache *cate for student understanding and* *tinez & A. Castro Superfine (Eds.).*

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

REFERENCES

- Ant, T. (2012). Developing robust forms of content knowledge through culturally reanalysis. *Mathematics Teacher Education and*
- K, D. (1997). *Interactive mathematics program, curriculum*.
- Anterra: *The new mestiza*. San Francisco, CA:
- . *This bridge we call home: Radical visions for*
- educators. (2017). *AMTE standards for math-*
- 5). Is it becoming too hard to fail? Schools
- ing policies. *The Washington Post*. Retrieved
- com
- (writer). (2012). *Won't back down*. USA: 20th
- ers want half of LAUSD students in charter
- s. *Los Angeles Times*. Retrieved from <http://>
- mathematics approach promoted respect, re-
- nt. *Theory Into Practice*, 45, 40–46.
- g mathematical future through an equitable
- ge Record, 110, 608–645.
- ew teacher identity and regulative government:
- mathematics teacher education. New York, NY:
- socio-cultural" and "socio-political" perspec-
- loring their implications for teacher educa-
- cher, 5, 13–20.
- . Administrative control in large-city school
- ago. *Educational Administration Quarterly*, 21,
- Esmonde, I. (2014). "Nobody's rich and nobody's poor. . . . It sounds good, but it's actually not": Affluent students learning mathematics and social justice. *Journal of the Learning Sciences*, 23(3), 348–391.
- Featherstone, H. (2011). *Smarter together: Collaboration and equity in elementary classrooms*. Reston, VA: National Council of Teachers of Mathematics.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Gaines, L. (2015). Evanston Township High School District 202 administrator weighs in on PARCC. *Chicago Tribune*. Retrieved from <http://www.chicagotribune.com>
- Gojak, L. M. (2012, June 5). Let's keep equity in the equation. *National Council of Teachers of Mathematics Summing Up*. Retrieved from https://www.nctm.org/News-and-Calendar/Messages-from-the-President/Archive/Linda-M_Gojak/Let_s-Keep-Equity-in-the-Equation/
- Goosetree. (2015, March 2). To PARCC or not to PARCC? Retrieved from <http://mrsgoosetree.weebly.com/blog/to-parcc-or-not-to-parcc>
- Gregson, S. A. (2013). Negotiating social justice teaching: One full-time teacher's practice viewed from the trenches. *Journal for Research in Mathematics Education*, 44(1), 164–198.
- Guggenheim, D. (writer, director), & Kimball, B. (writer). (2010, released October 29). *Waiting for Superman*. USA: Paramount.
- Gutiérrez, R. (1999). Advancing Urban Latina/o youth in mathematics: Lessons from an effective high school mathematics department. *The Urban Review*, 31(3), 263–281.
- Gutiérrez, R. (2002a). Beyond essentialism: The complexity of language in teaching Latina/o students mathematics. *American Educational Research Journal*, 39(4), 1047–1088.
- Gutiérrez, R. (2002b). Enabling the practice of mathematics teachers in context: Towards a new equity research agenda. *Mathematical Thinking and Learning*, 4(2&3), 145–187.
- Gutiérrez, R. (2006). *How would you classify it?* Unpublished professional development activity used in the secondary mathematics teacher education program at the University of Illinois at Urbana-Champaign.
- Gutiérrez, R. (2007). Context matters: Equity, success, and the future of mathematics education. In Lamberg, T., & Wiest, L. R. (Eds.), *Proceedings of the 29th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 1–18). Stateline, NV: University of Nevada, Reno.
- Gutiérrez, R. (2009). Embracing the inherent tensions in teaching mathematics from an equity stance. *Democracy and Education*, 18(3), 9–16.
- Gutiérrez, R. (2010/2013). The sociopolitical turn in mathematics education. *Journal for Research in Mathematics Education*, 44(1), 37–68.
- Gutiérrez, R. (2012). Embracing "Nepantla": Rethinking knowledge and its use in teaching. *REDIMAT: Journal of Research in Mathematics Education*, 1(1), 29–56.
- Gutiérrez, 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*

- North American Chapter of the International Group for the Psychology of Mathematics Education. (pp. 1248–1251) Chicago, IL: University of Illinois at Chicago.
- Gutiérrez, R. (2013b). Why (urban) mathematics teachers need political knowledge. *Journal of Urban Mathematics Education*, 6(2), 7–19.
- Gutiérrez, R. (2014, October). *When professional development is not enough: Secondary mathematics teaching in an era of high stakes education*. Selected presentation given at the annual meeting of the Society for Advancement of Chicanos and Native Americans in Science. Los Angeles, CA.
- Gutiérrez, R. (2015a). Nesting in Nepantla: The importance of maintaining tensions in our work. In N. M. Joseph, C. Haynes, & F. Cobb (Eds.), *Interrogating Whiteness and relinquishing power: White faculty's commitment to racial consciousness in STEM classrooms* (pp. 253–282). New York, NY: Peter Lang.
- Gutiérrez, R. (2015b). Risky business: Mathematics teachers using creative insubordination. In T. G. Bartell, K. N. Bieda, R. T. Putnam, K. Bradfield, & H. Dominguez (Eds.), *Proceedings of the 37th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 679–686). East Lansing, MI: Michigan State University.
- Gutiérrez, R., & Gregson, S. (2013, April). *Mathematics teachers and creative insubordination: Taking a stand in high-poverty schools*. Paper presented at the Annual Meeting of the American Educational Research Association. San Francisco, California.
- Gutiérrez, R., Irving, S., & Gerardo, J. M. (2013, April). *Mathematics, marginalized youth, and creative insubordination: A model for preparing teachers to reclaim the profession*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, California.
- Gutstein, E. (2003). Teaching and learning mathematics for social justice in an urban, Latino school. *Journal for Research in Mathematics Education*, 34, 37–73.
- Gutstein, E. (2006). *Reading and writing the world with mathematics: Toward a pedagogy for social justice*. New York, NY: Routledge.
- Heitin, L. (2015, March 10). Math consultant: Smarter Balanced math tests have 'egregious flaws.' *Education Week*. Retrieved from http://blogs.edweek.org/edweek/curriculum/2015/03/math_consultant_smarter_balanc.html
- Hill, H. C., Blunk, M. L., Charalambous, C. Y., Lewis, J. M., Phelps, G. C., Sleep, L., & Ball, D. L. (2008). Mathematical knowledge for teaching and the mathematical quality of instruction: An exploratory study. *Cognition and Instruction*, 26(4), 430–511.
- Horn, I. (2004). Why do students drop advanced mathematics courses? *Educational Leadership*, 62(3), 61–64.
- Horn, I. (2005). Learning on the job: A situated account of teacher learning in high school mathematics departments. *Cognition and Instruction*, 23(2), 207–236.
- Jilk, L. (2010). Becoming a liberal math learner: Expanding secondary school mathematics to support cultural connections, multiple mathematical identities and engagement. In R. S. Kitchen & M. Civil (Eds.), *Transnational and borderland studies in mathematics education* (pp. 69–94). New York, NY: Routledge.
- Kamenetz, A. (2016, March). Pearson's quest to cover the planet in company-run schools. *Wired*. Retrieved from <https://www.wired.com/2016/04/apec-schools/>

- Klein, R. (2014, March 20). Winner pressing thoughts about the s
trieved from <http://www.huff>
prize_n_6910948.html
- Lampert, M., Franke, M. L., Kazemi, F.
Cunard, A., & Crowe, K. (2013).
port novice teacher learning of
tion, 64(3), 226–243.
- LaReviere, T. (2015, March 31). An o
tion Chairman, Reverend James I
net/2015/03/31/isbes-ungodly-s
Lifshitz, J. (2015). An open letter to my
do to you. *The Huffington Post*. I
com/jessica-lifshitz/an-open-lette
Look-Ainsworth, M. (2015, February 9)
Marquette Educator. Retrieved fr
com/2015/02/09/an-open-letter
Madrigal, A. C. (2014, May 22). The rac
hood. *The Atlantic*. Retrieved from
Martin, B. (1997). Mathematics and soc
stein (Eds.), *Ethnomathematics: C
tion* (pp. 155–172). Albany: State I
Mighton, J. (2004). *The myth of ability*.
Toronto, ON: Walker Books.
- Moraga, C., & Anzaldúa, G. (1981). *This
en of color*. Watertown, MA: Persepi
Nasir, N. S., Cabana, C., Shreve, B., Woo
for equity: A framework for successfu
Press.
- Natale, E. A. (2014, January 17). Why I v
rant. Retrieved from <http://www.c>
National Governors Association Center f
School Officers. (2010). *Common C*
ton, DC: Authors.
- National Research Council. (2001). *Addi*
Washington, DC: National Academ
National Council of Teachers of Mather
school mathematics. Reston, VA: Auth
National Council of Teachers of Mathem
tion. Reston, VA: Author.
- Ottermann, S. (2011, August 13). In \$32 i
for its standardized tests. *The New*
nytimes.com
- Persson, J. (2015, September 22). CMD pu
interactive map). Retrieved from I
12936/cmd-publishes-full-list-2500-

- ational Group for the Psychology of Mathematics
a, IL: University of Illinois at Chicago.
- mathematics teachers need political knowl-
Education, 6(2), 7–19.
- essional development is not enough: Secondary
high stakes education. Selected presentation
Society for Advancement of Chicanos and
Angeles, CA.
- ntia: The importance of maintaining ten-
C. Haynes, & F. Cobb (Eds.), *Interrogating
White faculty's commitment to racial consciousness*
New York, NY: Peter Lang.
- hematics teachers using creative insubordi-
a, R. T. Putnam, K. Bradfield, & H. Domin-
annual meeting of the North American Chapter of
Psychology of Mathematics Education (pp. 679–686).
University.
- l). *Mathematics teachers and creative insubor-
erty schools*. Paper presented at the Annual
onal Research Association. San Francisco,
- L. (2013, April). *Mathematics, marginalized
model for preparing teachers to reclaim the pro-
ual meeting of the American Educational
o, California.*
- ng mathematics for social justice in an ur-
arch in *Mathematics Education*, 34, 37–73.
- he world with mathematics: Toward a pedagogy
ledge.
- ultant: Smarter Balanced math tests have
Retrieved from http://blogs.edweek.org/h_consultant_smarter_balanc.html
- C. Y. Lewis, J. M., Phelps, G. C., Sleep, L.,
al knowledge for teaching and the math-
exploratory study. *Cognition and Instruction*,
- vanced mathematics courses? *Educational*
- uated account of teacher learning in high
Cognition and Instruction, 23(2), 207–236.
- arner: Expanding secondary school math-
ections, multiple mathematical identities
& M. Civil (Eds.), *Transnational and bor-
ism* (pp. 69–94). New York, NY: Routledge.
- quest to cover the planet in company-
n <https://www.wired.com/2016/04/apec>
- Klein, R. (2014, March 20). Winner of \$1 million teaching prize has some de-
pressing thoughts about the state of education. *The Huffington Post*. Re-
trieved from http://www.huffingtonpost.com/2015/03/20/nancie-atwell-prize_n_6910948.html
- Lampert, M., Franke, M. L., Kazemi, E., Ghouseini, H., Turrou, A. C., Beasley, H.,
Cunard, A., & Crowe, K. (2013). Keeping it complex: Using rehearsals to sup-
port novice teacher learning of ambitious teaching. *Journal of Teacher Educa-
tion*, 64(3), 226–243.
- LaReviere, T. (2015, March 31). An open letter to Illinois State Board of Educa-
tion Chairman, Reverend James Meeks. Retrieved from <https://troylaraviere.net/2015/03/31/isbes-ungodly-stand-against-illinois-children/>
- Lifshitz, J. (2015). An open letter to my students: I am sorry for what I am about to
do to you. *The Huffington Post*. Retrieved from http://www.huffingtonpost.com/jessica-lifshitz/an-open-letter-to-my-students-parcc_b_6808060.html
- Look-Ainsworth, M. (2015, February 9). An open letter to Governor Walker. *The
Marquette Educator*. Retrieved from <https://marquetteeducator.wordpress.com/2015/02/09/an-open-letter-to-governor-walker/>
- Madrigal, A. C. (2014, May 22). The racist housing policy that made your neighbor-
hood. *The Atlantic*. Retrieved from <http://www.theatlantic.com>
- Martin, B. (1997). Mathematics and social interests. In A. B. Powell & M. Franken-
stein (Eds.), *Ethnomathematics: Challenging Eurocentrism in mathematics educa-
tion* (pp. 155–172). Albany: State University of New York Press.
- Mighton, J. (2004). *The myth of ability: Nurturing mathematical talent in every child*.
Toronto, ON: Walker Books.
- Moraga, C., & Anzaldúa, G. (1981). *This bridge called my back: Writings by radical wom-
en of color*. Watertown, MA: Persephone Press.
- Nasir, N. S., Cabana, C., Shreve, B., Woodbury, E., & Louie, N. (2014). *Mathematics
for equity: A framework for successful practice*. New York, NY: Teachers College
Press.
- Natale, E. A. (2014, January 17). Why I want to give up teaching. *The Hartford Cour-
rant*. Retrieved from <http://www.courant.com>
- National Governors Association Center for Best Practices & Council of Chief State
School Officers. (2010). *Common Core State Standards for Mathematics*. Washing-
ton, DC: Authors.
- National Research Council. (2001). *Adding it up: Helping children learn mathematics*.
Washington, DC: National Academy Press.
- National Council of Teachers of Mathematics. (2000). *Principles and standards for
school mathematics*. Reston, VA: Author.
- National Council of Teachers of Mathematics. (2008). *Equity in Mathematics Educa-
tion*. Reston, VA: Author.
- Otterman, S. (2011, August 13). In \$32 million contract, state lays out some rules
for its standardized tests. *The New York Times*. Retrieved from <http://www.nytimes.com>
- Persson, J. (2015, September 22). CMD publishes list of closed charter schools (with
interactive map). Retrieved from <http://www.prwatch.org/news/2015/09/12936/cmd-publishes-full-list-2500-closed-charter-schools>

- Phillips, E. (2014). We need to talk about the test: A problem with the Common Core. *The New York Times*. Retrieved from <https://www.nytimes.com>
- Powell, A. B., & Frankenstein, M. (Eds.). (1997). *Ethnomathematics: Challenging Eurocentrism in mathematics education*. Albany: State University of New York Press.
- Rado, D. (2016, August 26). Math scores improve, English marks drop on state PARCC exams. *Chicago Tribune*. Retrieved from <http://www.chicagotribune.com>
- Rosemond, J. (2004, February 1). Are public school teachers slackers or dedicated educators? *The Southern Illinoisan*. Retrieved from <http://thesouthern.com>
- Seattle Education. (2015, November 13). Charter schools: A map of failure and a money vortex. Retrieved from <https://seattleducation2010.wordpress.com/2015/11/13/charter-schools-a-map-of-failure-and-a-money-vortex/>
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14.
- Singer, A. (2014, December 15). Pearson education can run, but it cannot hide. *The Huffington Post*. Retrieved from http://www.huffingtonpost.com/alan-singer/pearson-education-can-run_b_6327566.html
- Stinson, D. W., & Bullock, E. C. (2015). Critical postmodern methodology in mathematics education research: Promoting another way of thinking and looking. *Philosophy of Mathematics Education Journal* [25th Anniversary Issue], 29, 1–18.
- Strauss, V. (2014, October 8). Pearson's wrong answer—and why it matters in the high-stakes testing era. *The Washington Post*. Retrieved from <https://www.washingtonpost.com>
- Strauss, V. (2015, March 14). Pearson monitoring social media for security breaches during PARCC testing. *The Washington Post*. Retrieved from <https://www.washingtonpost.com>
- Tough, P. (2016, June). How kids learn resilience. *The Atlantic*. Retrieved from <http://www.theatlantic.com/>
- Turner, E. E., Gutierrez, M. V., & Diez-Palomar, J. (2011). Latina/o Bilingual Elementary Students Pose and Investigate Problems Grounded in Community Settings. In K. Tellez, J. N. Moschkovich, & M. Civil (Eds.), *Latino/as and mathematics education: Research on learning and teaching in classrooms and communities* (pp. 149–174). New York, NY: Information Age.
- Turner, E. E., & Strawhun, B. T. F. (2005). "With math, it's like you have more defense": Students investigate overcrowding at their school. In E. Gutstein & B. Peterson, (Eds.), *Rethinking mathematics: Teaching social justice by the numbers* (pp. 81–89). Milwaukee, WI: Rethinking Schools.
- Valero, P., & Zevenbergen, R. (2004). *Researching the socio-political dimensions of mathematics education: Issues of power in theory and methodology*. Norwell, MA: Kluwer.
- Vilson, J. (2012, November 28). An open letter to Chancellor Dennis Walcott and others on the idea of assessment. Retrieved from <http://thejosevilson.com/open-letter-to-chancellor-dennis-walcott-and-others-on-the-idea-of-assessment/>
- Walkerdine, V. (1988). *The mastery of reason: Cognitive development and production of rationality*. London, England: Routledge.
- Walshaw, M. (2001). A Foucauldian gaze on gender research: What do you do when confronted with the tunnel at the end of the light? *Journal for Research in Mathematics Education*, 32(5), 471–492.

- Weinberg, M. (2003). A short history of... Retrieved from <http://www.newhistory.org/>
- XXCD. (n.d.). *Purity*. Retrieved from <http://www.xxcd.com/>

ut the test: A problem with the Common
d from <https://www.nytimes.com>
(1997). *Ethnomathematics: Challenging Eu-*
Albany: State University of New York Press.
mprove, English marks drop on state PARCC
rom <http://www.chicagotribune.com>
ublic school teachers slackers or dedicated
Retrieved from <http://thesouthern.com>
). Charter schools: A map of failure and
n <https://seattleducation2010.wordpress.com>
-a-map-of-failure-and-a-money-vortex/
stand: Knowledge growth in teaching. *Edu-*

education can run, but it cannot hide. *The*
p://www.huffingtonpost.com/alan-singer/
7566.html
Critical postmodern methodology in math-
noting another way of thinking and looking.
Journal [25th Anniversary Issue], 29, 1–18.
s wrong answer—and why it matters in the
Washington Post. Retrieved from <https://www>.

monitoring social media for security breach-
Washington Post. Retrieved from <https://www>.

m resilience. *The Atlantic*. Retrieved from

e-Palomar, J. (2011). Latina/o Bilingual El-
estigate Problems Grounded in Community
ovich, & M. Civil (Eds.), *Latino/as and math-*
ing and teaching in classrooms and communities
ormation Age.
15). "With math, it's like you have more de-
crowding at their school. In E. Gutstein & B.
ematics: Teaching social justice by the numbers
hinking Schools.
Researching the socio-political dimensions of math-
theory and methodology. Norwell, MA: Kluwer.
en letter to Chancellor Dennis Walcott and
L. Retrieved from <http://thejosevilson.com/walcott-and-others-on-the-idea-of-assessment/>
reason: Cognitive development and production of
utledge.
e on gender research: What do you do when
e end of the light? *Journal for Research in Math-*
2

Weinberg, M. (2003). A short history of American capitalism. New History Press.
Retrieved from <http://www.newhistory.org/AmCap.pdf>
XKCD. (n.d.). *Purity*. Retrieved from <https://xkcd.com/435/>