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Review of *Towards Equity and Justice in Mathematics Education*, edited by Tonya Gau Bartell

Emily Lardner
Grays Harbor College, emily.lardner@ghc.edu

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Abstract

Tonya Gau Bartell, editor. 2018. *Toward Equity and Social Justice in Mathematics Education*. (Cham, Switzerland: Springer International Publishing). 341 pp. ISBN 978-3-319-92906-4 (also available as an e-book).

Toward Equity and Social Justice in Mathematics Education is a welcome addition to ongoing conversations about what mathematics should be taught and how it should be taught at both the college and pre-college level. Although the primary audience for the volume will be math educators and researchers, readers of this journal will discover intersecting interests, concerns, and strategies.

Keywords

mathematics education, mathematics reform, faculty development, quantitative literacy

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Cover Page Footnote

Emily Lardner is a member of the *Numeracy* Editorial Board. She is the Vice President of Instruction at Grays Harbor College, a community college in Aberdeen, WA. She is the former director of the Washington Center for Improving Undergraduate Education and has a particular interest in the relationship between faculty development and student learning.

Questions of equity, social justice, and mathematics education were central to the discussions that led to the founding of this journal ten years ago. At that time, *Numeracy*'s mission was to advance "a society in which all citizens possess the power and habit of mind to search out quantitative information, critique it, reflect upon it, and apply it in their public, personal, and professional lives." The push for quantitative literacy across the curriculum was democratic in that the goal was to help all students gain the knowledge and skills they need to act effectively in a world awash in numbers. For many educators, quantitative literacy was seen as an alternative to traditional mathematics curricula.

In the ten years since the founding of this journal, significant work has gone into examining math pathways, particularly in the community college sector. Led by Uri Treisman, the Dana Center Mathematics Pathways (DCMP) project mission aligns with the vision of *Numeracy* and NNN: "A working knowledge of basic mathematics empowers individuals to engage productively in a society and economy that increasingly rely on data and quantitative reasoning. Yet all too often, mathematics is an obstacle, rather than an opportunity, to students who want to achieve their career goals through higher education."¹ The DCMP identified two obstacles in particular: math course content that isn't aligned to students' career and life goals, and overly long sequences of pre-college math courses.

The Carnegie Math Pathways have been designed as solutions to these problems. *Statway* combines college-level statistics with developmental math. *Quantway* focuses on quantitative reasoning and fulfills developmental requirements. While the math pathways work enjoys wide support, some mathematicians and math educators are concerned that pathways amounts to a contemporary form of tracking. For example, Robert P. Moses, mathematician and civil rights organizer, argues that learning algebra is a basic civil right. Given the role that algebra plays as a gatekeeping course in schools, young people who don't take it or pass it get shunted aside. Without algebra, Moses argues, young people, especially young people of color, are given a "sharecropper" education. As Moses put it in a speech at North Seattle Community College in February 2003, "You have a whole people who are only going to do a certain kind of work, and so they only need a certain kind of education, the sort of education really tied to menial work."²

Bartell's new book is a welcome contribution to these lively and consequential conversations about math education. As Bartell explains in the preface, the book grew out of the 2015 Annual Meeting of the North American Group of the Psychology of Mathematics Education (PME-NE) held at Michigan State

¹ <http://dcmathpathways.org/learn-about-mathematics-pathways>: retrieved from the DCMP website 12-6-18

² http://wacenter.evergreen.edu/sites/wacenter.evergreen.edu/files/fall2003_0.pdf: retrieved on 12-6-18 from a newsletter published by the Washington Center for Improving Undergraduate Education in 2003 and posted on the Washington Center website

University. The conference theme was *Critical Responses to Enduring Challenges in Mathematics Education*. Authors included in this volume presented papers that explicitly addressed issues of equity and justice in mathematics education. *Toward Equity and Justice in Mathematics Education* is divided into four sections: 1) theoretical and political perspectives toward equity and justice in mathematics education; 2) identifying and connecting to family and community funds of knowledge; 3) student learning and engagement in preK–12 mathematics classrooms; and 4) supporting teachers on addressing the needs of marginalized students. Each section concludes with a commentary that poses questions for additional research.

As I read through the volume, I was struck with the differences between preK–12 and post-secondary mathematics. In the community college sector, our ability to pilot new math curriculum is substantially constrained by the network of articulation agreements we live within. In WA State, for example, changes in the math pathway leading to and through college-level math courses are guided by the University of Washington’s decision that only those courses with an intermediate algebra prerequisite can count for transfer. We have more liberty to experiment with pedagogy, and to that end, chapters in this volume are useful. Several chapters in particular are likely to interest many, if not most, of the diverse readers of this journal.

Everyone working in post-secondary education swims within a policy world, whether those policies are visible or not. For example, the governor of Washington just announced his budget for the next biennium, and it features a signature project, the Career Connect Washington Task Force. The governor’s budget proposes new investments in career-connected learning in order to meet the needs of the state’s economy. In “Disrupting Policies and Reforms in Mathematics Education to Address the Needs of Marginalized Learners,” Robert Q. Berry III suggests that math education policies, including the call to reform math education, too often reflect a bias for economic growth as opposed to forwarding an agenda of creating equitable learning opportunities for all students. Skillful educators learn to work within policies that foreground economic growth rather than equity, but Berry wants readers to notice that disconnect, echoing Robert Moses’ concern that we are still caught in an ideological trap of educating students to fit the needs of the workforce. Berry also points out that the language of math reform too often and too easily identifies black, Latinx, and indigenous students as somehow deficient, rather than addressing structural issues, including access to highly qualified teachers and issues of racism.

In “Making the Implicit Explicit: Building a Case for Implicit Racial Attitudes to Inform Mathematics Education Research,” Dan Battey and Luis A. Leyva provide a nuanced analysis of teacher perceptions by examining implicit racial attitudes. Batty and Leyva argue that while mathematics knowledge for teaching

(MKT) plays a role in student achievement, the importance of MKT is heavily mediated by other factors, particularly by teachers' "deficit reasoning" about African American students. Citing multiple studies, they claim that teachers' implicit racial biases about African American students are strongly correlated with instructional practices that focus on repeating steps to get correct answers and reserving the goal of understanding for later in their school careers. Examining the connections between teachers' beliefs about students' abilities and their instructional practices, and considering the role that implicit racist attitudes play, is the work of all educators, not just in preK–12 or in mathematics. As Batty and Leyva point out, given the aim of designing professional development for teachers so that it has an impact on instructional practice, educators must recognize that implicit racial attitudes exist and consider how they function in order to support teacher change and understand why some teachers resist taking on new practices.

Another chapter in this volume provides a compelling example of well-designed QL instruction aimed at high school students that could easily be adapted for college QL courses. In "So We Only Have One We Share with More, and Then They Have Way More and They Share Less": Mathematics and Spatial Justice," Laurie H. Rubel et al. describe teaching mathematics for spatial justice through a curricular module called "Cash City." Cash City is based on a mathematical analysis of interest rates that compares the costs of personal loans at banks and alternative financial institutions (AFI) like pay-day loans, check-cashing stores, and pawnshops. Students also examined the distribution of AFIs and banks from a geographical perspective. The goal of the unit was to give students an opportunity to use mathematics as a tool to understand percent and ratio in the context of the power relations underlying the socio-spatial distribution of access to interest rates. The authors conclude that contextualizing mathematical concepts successfully engaged students. In their next iteration of Cash City, they explain, they want to facilitate further discussions with students about how the socio-spatial distribution might change.

Toward Equity and Social Justice in Mathematics Education is a welcome addition to ongoing conversations about what mathematics should be taught and how it should be taught at the college and the pre-college level. Although the primary audience for the volume will be math educators and researchers, readers of this journal will discover intersecting interests, concerns, and strategies.

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