

EARLY CAREER

The Early Career Section provides information and suggestions for early career mathematicians and those who mentor them. Angela Gibney serves as the editor of this section with assistance from Early Career Intern Katie Storey. In this issue we are printing excerpts from the new soon-to-be-published book *Justice Through the Lens of Calculus*. Next month we will feature articles in celebration of Women's History Month.



From *Justice Through the Lens of Calculus*

Justice Through the Lens of Calculus: Framing New Possibilities for Diversity, Equity, and Inclusion

Over the last few decades mathematicians have become increasingly resistant to the use of calculus instruction as a gatekeeper to a STEM education. Lynn Arthur Steen's call to let calculus be "a pump not a filter" inspired a generation of reform starting in the late 1980s. And yet, DFW rates for calculus remain high and calculus remains a barrier for many of our students. The NSF-funded "Progress Through Calculus" project took a hard look at the problem and attempted to identify practices common to successful programs. *Justice Through the Lens of Calculus* is the third volume of results inspired by that project. It focuses on identifying practices that can help us with our diversity and inclusion problems. It contains thirty case studies of calculus programs that are aimed at making success in calculus available to previously excluded or underrepresented populations along with a handful of essays on cross-cutting themes that emerged from the study. The complete volume from which the accompanying excerpts are taken is available (free e-book for MAA members in the Member Library, print-on-demand pdf to non-MAA members for a modest charge) at the MAA's website along with the two earlier volumes. It is essential reading.

Building an Evolving Framework: A Clarion Call / Manifesto

Gregory V. Larnell

A volume such as this one represents both an abiding concern and an urgent call to the field: No longer is it possible (if ever, at least not in good conscience) to look beyond longstanding, abysmal, systemic patterns of exclusion attributable to the curricular trajectory to and through calculus—patterns that stubbornly, chronically, yet persistently

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adhere and contribute to identity-based disparities within the broader society. The call this time, however, is even broader and includes the following corollary: *The responsibility for redressing these deep inequities should not be relegated to a small, impassioned group of reformers but shared by the entire community of faculty members and academic researchers who steward the undergraduate mathematics education corridor.* Simply put, the responsibility for redressing injustice belongs to all of us.

As Kilpatrick (2013) argues, we need more research and more researchers within this community toward “seeing our work whole” (p. 173)—that is, toward seeing the whole of undergraduate mathematics education collectively and fully serve all learners and, ultimately, toward contributing to the advancement of our society. This volume represents considerable, yet ultimately incremental, progress toward that goal.

This volume also represents an invitation—an invitation to engage. No matter what your particular area of focus may be, it is necessary to consider how your work can connect to and expand the imperatives of greater diversity, equity, and inclusion. The authors of this volume are working toward this goal and offer all of us evidence that this work is not just possible but vital and crucial.

Justice through the lens of calculus as an evolving framework seeks to unify a vision for calculus programs that are diverse, equitable, and inclusive while critically examining how they are situated within current power structures and levels of enactment. Drawing on the joint vision from *TODOS: Mathematics for ALL*¹ and the National Council of Supervisors of Mathematics (NCSM), “A social justice stance requires a systemic approach that includes fair and equitable teaching practices, high expectations for all students, access to rich, rigorous, and relevant mathematics, and strong family/community relationships to promote positive mathematics learning and achievement. Equally important, a social justice stance interrogates and challenges the roles power, privilege, and oppression play in the current unjust system of mathematics education—and in society as a whole” (todos-math.org). Toward that end, our collective work must expand and include fervent attention to how our students and colleagues are experiencing not only mathematical content and processes writ large but also critically analyzing longstanding legacies of exclusion, tracking, and gatekeeping practices; status-laden hierarchies; and a variety of implicit practices that all-too-often inveigle individuals to shed parts of their identities in order to belong.

References

Kilpatrick, J. (2013). Needed: Critical Foxes. In K. R. Leatham (Ed.), *Vital Directions for Mathematics Education Research* (pp. 173–187). New York: Springer.

¹*TODOS: Mathematics for ALL is an international professional organization that advocates for equity and excellence in mathematics education for ALL students—in particular, Latina/o students.*

Introduction to this Volume

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Preface

The idea for creating this volume emerged from an NSF-funded research project entitled “Progress through Calculus” (DUE I-USE #1430540). The focus of the Progress through Calculus (PtC) project was to examine the Precalculus through Calculus II course sequence and associated supports in United States (U.S.) colleges and universities. The project consisted of two phases of data collection and analysis. In the first phase, a national census survey was sent to mathematics departments offering a graduate degree (master’s or Ph.D.) in mathematics. The survey gathered information to better understand the characteristics of successful calculus programs. In the second phase of the project, in-depth longitudinal case studies were conducted at 12 colleges and universities. The case studies investigated models of the Precalculus through Calculus II sequence, their implementations, and their impact on student outcomes. More details about the entire project are located at: <https://maa.org/ptc>.

As a result of this research, Editors Hagman, Voigt, and Gehrtz formed a thematic research team examining issues of diversity, equity, and inclusion (DEI) across the national census survey data and the 12 case study universities. It became clear that while many of the members of mathematics departments valued issues of DEI, most did not yet have actionable ideas or strategies for addressing these ideas locally within their departments. Additionally, many departments pointed towards broader university-wide programs for addressing issues of DEI, with only a select few having local initiatives within the purview of the mathematics department.

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