

JOURNAL OF
MATHEMATICS
EDUCATION
AT TEACHERS COLLEGE

A Century of Leadership in Mathematics and Its Teaching

Reconsidering Elements of Research and Practice

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PREFACE

A Brief Introduction for Posterity

We begin this issue of the *Journal of Mathematics Education at Teachers College (JMETC)* by noting its publication at a most unusual time in the world. The COVID-19 viral pandemic has upended human life in almost every part of the planet. Scholars agree that the influence of this epoch will be seen for decades, if not centuries, to come. At the time of this preface's writing, some of the most essential functions of societies have faced tremendous difficulty and even failure. Therefore, all who have served others during this emergency deserve tremendous praise and gratitude. Among these individuals are teachers, who have been charged with meaningfully teaching the world's future generations during a global crisis. On behalf of everyone at *JMETC*, we wish to sincerely thank—with the utmost sincerity and conviction—educators everywhere for risking their lives and responding valiantly, despite the tremendous associated burden and sacrifice. In honoring and commending the world's teachers, we proceed with the publication of this issue under some of the most challenging and unprecedented circumstances in modern history, so that it may serve as a symbol of educators' unending commitment and resilience. We are therefore humbled to present this artifact to stand in honor of educators across the world.

Reconsidering Elements of Research and Practice: Some Perspectives

The Fall 2020 issue of *JMETC* presents six research and practice-based articles that invite readers to reconsider research in practice from several different perspectives. Some pieces reconsider traditional instructional materials, lesson design, classroom discourse, and assessment. We also present a paper that reconsiders research in understudied subfields of mathematics education. Together, these contributions provide readers with unique perspectives on contemporary research and practice and offer clear directions for future work in these areas.

To begin this issue of *JMETC*, Hung-Hsi Wu, a leader in the field of mathematics education, challenges our conception of K-12 mathematics textbooks and their role in curriculum and instruction. Through his illustration of how school textbooks present the division algorithm in a manner that promotes mathematical misconception and misunderstanding, Wu argues that K-12 mathematics teaching has been disserved by the textbooks that are used. Accordingly, he calls for a reconsideration of how textbooks are authored, valued, and used in school mathematics. Within his critique, Wu offers possible remedies for the issues he claims are inherent in what he refers to as “Textbook School Mathematics.”

PREFACE (Continued)

Next, Campbell and Yeo explore the nature of the contributions made by students to mathematical discourse in the classroom. Complimenting research focusing on teachers' roles in scaffolding mathematical discourse, Campbell and Yeo offer a theoretical framework for students' responsibilities in these interactions. The authors then utilize this framework to analyze authentic vignettes of student discourse in middle and postsecondary classrooms. Campbell and Yeo's work encourages practitioners at all educational levels to consider students' roles in generating and maintaining meaningful mathematical conversations to promote understanding.

Barba continues the focus on discourse through an investigation of mathematical discourse outside of the classroom. Her analysis contributes to the understudied area of mathematical discourse on social media. Barba reports that social media discourse can reveal meaningful information about individuals' mathematical mindsets and identities. Through a unique investigation of discourse surrounding a mathematics problem posted to a social media site, Barba provides a thought-provoking exploration of what can be learned by individuals' unfiltered interactions online. By framing her findings within the context of existing research, Barba highlights the relevance of her work and describes avenues for future research in this emerging field.

MacMahon and Mongroo continue the issue with a timely analysis of literature on alternative mathematical assessments for postsecondary educators. In detailing online, oral, and project-based assessments, MacMahon and Mongroo highlight the potential benefits, drawbacks, and important considerations for using each type of assessment in modern postsecondary classrooms. In this guide for practicing teachers, the authors provide clear and actionable information about non-traditional assessment as well as an easy-to-use checklist designed to help teachers leverage these to assess their students' learning.

Next, we feature our "Notes from the Field" section, which offers short papers detailing classroom practice. In the first piece, Simon describes how her students utilized a dynamic geometry software program to create personalized logos. This classroom episode provides readers with an example of how one practitioner reconceptualized mathematical modeling through the lens of design to engage students in the learning of geometric transformations. In addition to providing lesson details, excerpts from video-recorded lessons, and examples of student work, Simon demonstrates the success of the current task and argues for incorporating more lessons of this type into K-12 mathematics classrooms.

PREFACE (Continued)

The issue ends with a classroom episode from Wheeler and her colleagues in which preservice and inservice teachers engage in a lesson incorporating innovative robotic technology. Wheeler et al. describe how they engaged students in a graduate mathematics education course in tasks that featured the Sphero BOLT, a small robotic device that can be moved utilizing mobile applications and basic computer code. The authors detail how they demonstrated the teaching of the concepts of velocity, time, and distance within an interdisciplinary lesson context combining supplemental learning in technology, computer science, and even children's literature. Wheeler and her colleagues note how such a lesson helps preservice and inservice teachers develop the capacity to design, structure, and implement such an experience for their future or current students. The authors also provide information for teacher educators interested in incorporating technology such as the BOLT into mathematics education classes at the postsecondary level.

In closing, we note that one of the foundational principles of mathematics education—and education in general—is that improvement stems from reflection, reconsideration, and thoughtful action. The articles presented herewith align with this purpose.

Brian Darrow, Jr.

Anisha Clarke

Guest Editors