Human Dimensions of Mathematical Diversity

The title of this focus issue—"Human Dimensions of Mathematical Diversity"—is meant to evoke the phenomenal variation found in the development of mathematical ideas between and within cultures and communities of practitioners. We use the term *human dimensions* because we want to highlight the social, cultural, and historical aspects of mathematical activity. We use the term *mathematical diversity* because we want to emphasize the various forms of mathematical activity one finds in any community or culture.

Historically, mathematics developed with contributions from many continents and cultures. In present times, mathematics continues to develop across the globe in both highly abstracted forms and in more contextual forms related to daily activities. As mathematics educators, we need to recognize and pay tribute to the truly multicultural aspects of mathematical activity. Although much of the mathematics practiced in schools has a connection to European mathematics, we must recognize that the Europeans were influenced by Arabic scholars and others. Furthermore, the mathematics of today does not conform monolithically to conventional high school curricula. From Google search algorithms to symmetries found in Mozambican weavings, mathematics is practiced according to a multitude of purposes and approaches that do not fit neatly into algebra, geometry, or calculus.

Focus Issue editors Mariano (Rod) Rodrigues, Rhode Island College (retired); Bonita G. Hayman, Parkway North High School, Missouri (retired); Jeffrey Choppin, University of Rochester, New York

That mathematics thrives as a result of a commingling of diverse approaches and ideas is true even in abstract mathematics. Witness the solution to Fermat's Last Theorem. Although Andrew Wiles solved the problem, he relied on the work of dozens of mathematicians to provide the necessary tools—tools not purposefully developed to solve that particular problem.

The diversity of approaches and cultural origins of past and present mathematical activity has implications for the classroom teacher. Mathematics learners bring with them a variety of cultural experiences and individual abilities. The variety of experiences and abilities means that students will find different approaches appealing (useful for learning) and will develop their own ways of thinking about mathematical concepts and solving problems. Diversity within classrooms simultaneously poses a challenge and offers a rich resource for teachers. The diversity of ways of thinking and solving problems can initiate substantive discussions about the underlying mathematics. The goal of the focus issue is to help teachers recognize and build from students' diverse thinking and abilities.

In this issue, the reader will, we hope, find a small but representative sample of the variety of disciplines, cultural origins, and forms of activities that make up mathematics. The articles selected for this issue each highlight one aspect of the human dimensions of mathematical diversity. We hope that you find this issue valuable and that it spurs you to consider how to use the diversity within your own classroom as a resource. ∞