

Preface to Part III

Theoretical, Conceptual, and Philosophical Foundations for Mathematics Education Research: Timeless Necessities

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Although four years old, Frank Lester's chapter *On the Theoretical, Conceptual, and Philosophical Foundations for Research in Mathematics Education* is a highly relevant and significant publication today—and it will be for many years to come. The three basic questions Lester addresses are fundamental to advancing our discipline now and in the future:

- What is the role of theory in education research?
- How does one's philosophical stance influence the sort of research one does?
- What should be the goals of mathematics education research?

In recent years we have seen a significant increase in the conceptual complexity of our discipline, necessitating that we address myriad factors within a matrix comprising people, content, context, and time (Alexander and Winne 2006). This complexity is further increased by ontological and epistemological issues that continue to confront both mathematics education and education in general, which unfortunately have not been directly addressed. Instead a utilitarian mix- and match-culture pervades the field due largely to the range of theories, models, and philosophies that researchers have at their disposal. Choosing the most appropriate of these, singly or in combination, to address empirical issues is increasingly challenging. As Lester notes, the current political intrusion, at least in the USA, into what mathematics should be taught, how it should be assessed, and how it should be researched further complicates matters. Indeed, Lester claims that the role of theory and philosophical bases of mathematics education has been missing in recent times, in large part due to the current obsession with studying “what works”—such studies channel researchers along pathways that limit theoretical and philosophical advancement.

On the other hand, if we compare the presence of theory and philosophy in mathematics education scholarship today with its occurrence in past decades, it is clear that theories and philosophies have become more prominent. New influences from

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domains such as cognitive science, sociology, anthropology and neurosciences are both natural and necessary given the increasing complexity of mathematics teaching and learning. Herein lies an anomaly, though. The elevation of theory and philosophy in mathematics education scholarship could be considered somewhat contradictory to the growing concerns for enhancing the relevance and usefulness of research in mathematics education (Silver and Herbst 2007). These concerns reflect an apparent scepticism that theory-driven research can be relevant to and improve the teaching and learning of mathematics in the classroom. Such scepticism is not surprising, given that we have been criticized for inadequacy in our theoretical frameworks to improve classroom teaching (e.g., King and McLeod 1999; Eisenberg and Fried 2009; Lesh and Sriraman 2005; Steen 1999). Claims that theoretical considerations have limited application in the reality of the classroom or other learning contexts have been numerous, both in mathematics education and in other fields (Alexander and Winne 2006). However, as Alexander and Winne stress, “principles in theory necessarily have a practical application” (p. xii); it remains one of our many challenges to clearly demonstrate how theoretical and philosophical considerations can enhance the teaching and learning of mathematics in the classroom and beyond. Lester’s chapter provides a solid foundation for addressing this challenge, in particular, his discussion on conceptual frameworks is an essential starting point.

References

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