A Deep Dive into Mathematics Education Research in Search of Significance

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Doing significant research is critical to building the quality of mathematics education research. However, a lack of consensus surrounding the meaning of key research terms used to convey the significance of our research exists. In this paper, I address the question: *What do we mean when we say research is significant?* I draw upon my own experiences and those of others as part of a 'deep dive' in search of significance in mathematics education research. In doing so, I clarify the meanings of key research terms, such as: significance, contributions and implications.

Hiebert et al. (2023) suggest that the importance of our research is judged by its "significance, contributions, and implications" (p. 106). This statement implies that while they are connected, each of these terms refers to a different aspect of research that taken together, argue for the importance of our research. Significance is mostly associated with the research questions we pose and for them to be potentially significant they need to address important issues or problems in education. Arguing significance purely because there is a 'gap' in the literature is not sufficient. Importantly, research significance is bound by context. What we perceive to be significant can change. Drawing upon Turing's (1950) research concerning artificial intelligence, we see how the *significance* of research can change but its *contribution* remains the same regardless of time and place.

Contributions are determined by the degree to which the research has moved the field forward and can only be determined at the end of a study. The greater the perceived importance of the problem investigated, the greater the perceived contribution of the research. Importantly, research contribution is most often cumulative; important advancements of knowledge in mathematics education rarely come from a single research study. Finally, implications of research are usually presented as suggestions for improving educational practices that are *reasonably* derived from our findings. Although we are aware of the necessity of claiming the significance, contribution, and implications of our work to argue its importance, without clarifying what these terms mean makes it almost impossible to present a convincing case.

An aim of this paper was to raise questions and spark conversations about aspects of doing and reporting significant mathematics education research. Refining our skills for arguing the case for the importance of research is critical for maintaining the credibility and quality of mathematics education research and for ensuring that it will have a significant impact on students' learning of mathematics.

References

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