

Research Brief

New Metaphors for New Understandings: Ontological Questions about Developing Grounded Theory in Engineering Education

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Background

Engineering education scholars have demonstrated an interest in broadening the scope of the field in multiple ways, including issues addressed and approaches employed. These scholars have argued the need to broaden the epistemological and methodological boundaries of the field. However, numerous challenges to such expansion exist, and they must be better understood if the potential of broadening the field's boundaries is to be fulfilled.

Purpose

This paper has three aims: 1) to demonstrate how new metaphors can contribute to grounded theory development, 2) to explain the significance of such approaches, and 3) to identify challenges of introducing grounded theories and new metaphors in engineering education research. The paper begins with a discussion of the methodological justification for developing grounded theories via new metaphors. An overview of one of our prior studies that attempted to develop a new metaphor-based grounded theory is then presented. Based on our experiences with that project, as well as other prior work, the challenges encountered in this type of work are then discussed. The discussion also raises larger questions about the nature of *theory* in engineering education research.

Methods

Data came from two sources. The first is semi-structured interviews with male and female faculty members and administrators in engineering, technology, and science fields at a large, public research university in the Midwestern region of the United States. The second is our experiences developing and publishing this work.

Results

Based on our experiences with this work, as well as other work, identified three distinct but interrelated challenges or tensions: a disconnect between calls for greater methodological diversity and reality of what that entails; a tendency to equate grounded theory with open coding; and a distinction between theory vs. Theory, with Theory being dominant in engineering education research.

Conclusions

The challenges and tensions identified through this experience build on prior observations we have made about the field of engineering education research. They raise questions for editorial boards, reviewers, authors, and others in fields such as engineering studies. As noted, the arguments for expanding the boundaries of the field have been decisively laid out; however, as this reflection suggests, there remain serious questions about the nature of theory and the methodological beliefs of reviewers and editors, which may hinder the expansion of the field. In part, challenges likely stem from competing conceptualizations of theory.

Implications for Practice

- 🕒 The engineering education research community should reflect upon questions, such as *What is theory? What ends does it currently serve in engineering education research, and what ends should it serve? What changes might be brought about by different dominant conceptualizations of theory and theorizing?*

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