

Towards Embodied Validity in Mathematics Education Research

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In 1993, Patti Lather proposed the notion of voluptuous, or embodied, validity. As part of her broader post-structural methodological inquiry, embodied validity was a way of speaking to the importance of lived experience. An author can describe something that happened, but that is significantly different than experience what happened oneself. Consider the transcript that includes a parenthetical remark indicating that a student has laughed. Now start laughing yourself: part your lips and stretch them out, feel the air coming out of your nose and the contraction of the chest; notice your eyes squinting and the repetitive heaving that is accompanied by unusual sounds; all the while, endorphins are released and others around you might be sympathetically laughing too. In my talk, I will be going on an adventure in thinking, one that explores why embodied validity matters in mathematics education research, both as a method for creating and interpreting data and as a method for communicating research. One of my premisses is that despite the growing interest in theories of embodiment, the methods that have been used in mathematics education research are still dominated by static, language-dominant and cognitively focused methods that often fail to adequately understand and express what is at stake in mathematics teaching and learning. The stakes are political because focusing only on what is said or what can be objectively seen and heard, frames both mathematics and knowledge in exclusive ways (de Freitas & Sinclair, 2017).

My talk will proceed in three parts, each motivated by a re-thinking of widely held assumptions about the role of the senses in knowing, the kinds of evidence that can give rise to knowledge, and the forms of experience required to communicate knowledge. Although this adventure began from my own inclusive materialist commitments (de Freitas & Sinclair, 2014), I hope this adventure might also be enriching for those of different theoretical persuasions.

Part 1: What Senses Matter in Mathematics?

When, as researchers, we look at a video clip, we often attend to what is said, both by the teachers and the students. If we are using theories of embodiment, we might also attend to student gestures, or even to their postures or gaze. If they are working with tools of any kind, we might also attend to their actions. Essentially, we are focused on what we can see and what we can hear. Howes (2022) brings together researcher from anthropologists, biologists, neuroscientists, and artists to propose that our typical focus on the five “cardinal” senses is quite restricted and that we may have many, many more (up to 32, according to Young (2021)). These include senses such as proprioception, pressure, rhythm, as well as mixed senses such as hand-eye. If we subscribe to theories of embodiment, surely these senses should matter in our research. However, as researchers, how can we “get at” these senses if we are only watching and listening to videos? Is it enough to be aware of these senses to see if they matter at all in mathematics teaching and learning? Can we feel them by watching videos? These questions are perhaps most important in contexts where students and teachers are using tools or materials that engage these other senses, such as touching screens or weaving thread, but they are also relevant to collective interactions, where sympathy and proprioception are often significant.

Part 2: Aestheticising Experience

Aestheticizing is a term I borrow from Fuller and Weizman (2021), who draw on the Ancient Greek concept of sensory knowing, so that aestheticizing experience is about rendering it “more attune to sensing” (Fuller & Weizman, 2021, p. 34). They use this idea of aestheticizing (2024). In J. Višňovská, E. Ross, & S. Getenet (Eds.), *Surfing the waves of mathematics education. Proceedings of the 46th annual conference of the Mathematics Education Research Group of Australasia* (pp. 21–22). Gold Coast: MERGA.

experience to describe the work of forensic architects, which aims “to uncover hidden, obfuscated facts” through tracking movements, disentangling “the making of a situation”, working out “the genesis of an incident” and “combining and interpreting clues that are already in the open” (p. 107). In contrast to representational research, which aims to account for what happened, or critical research, which is interested in the hidden formative forces of representations, their investigations are interested in the formation of the representations to propose “new conditions of knowing, seeing and doing” (p. 111). Fuller and Weitzman use simulations to do their work. They will recreate a crime scene, for example, and run through the crime multiple times in order to create new conditions of knowing: for example, what could be heard or seen or smelt from different positions? What if we as researchers also conducted simulations, by re-enacting the videos from research sites (see Günes et al., 2024)? Would we be able to feel the pressure required to make something move on the screen or the changing nature of hand-eye coordination as screen touches are made? In other words, rather than seeing bodily movements only as the representation of mathematical thinking, what new conditions for knowing and doing mathematics might arise?

Part 3: *Not Obviating the Necessity for Direct Experience*

Shapin (1984) traces the technologies of scientific research that were devised by Robert Boyles during his air pump experiments in the 1650s, and that have since become normative in empirical research (including mathematics education research). Shapin argues that Boyles created a literary technology of virtual witnessing, which was “the production in a reader’s mind of such an image of an experimental scene as obviates the necessity for either its direct witness or its replication” (p. 491). The researchers must provide details of what happened, in objective ways, so that the reader finds the experiment credible (as well as potentially replicable). As a consequence, writing the experimental report became just as important as the experiment itself, since it enabled the establishment of matters of fact by the public.

This is what we do in our journal publications. Our writing is circumstantially dense as we provide descriptions of the research setting and even more specific and detailed accounts of the events that occurred, including the things said as well as the actions made. Transcripts are part of this technology of knowledge production, enabling the kind of virtual witnessing that Shapin identifies (Sinclair, 2024). However, I wonder whether transcripts really obviate the necessity for direct experience? In the case of accounting for experience in which multiple senses are at stake, like the kinetic and the tactile, witnessing seems insufficient. What new literary technologies might render possible direct experience?

References

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