

Formation of agency in science students: how a close-up view helps challenge unjust and unhelpful orthodoxies

Ashish Agrawal

Department of Curriculum Development, Planning and Coordination, National Institute of Technical Teachers Training and Research, Chennai, ashishag@vt.edu

Margaret Blackie

Centre for Higher Education Research on Teaching and Learning, Rhodes University, mblackie@sun.ac.za

Jennifer M. Case, Benjamin Goldscheider, Nicole Pitterson

Department of Engineering Education, Virginia Tech, jencase@vt.edu, bgoldsch@vt.edu, npitters@vt.edu

Jan McArthur

Department of Educational Research, Lancaster University, j.mcarthur@lancaster.ac.uk

Abstract

The think pieces of Phipps and Macfarlane throw down two different challenges for close-up researchers. Phipps asks how we can continue our research in meaningful and ethical ways within hostile climates and Macfarlane asks whether we are sure our research is meaningful and ethical. This paper is an open account of the difficult reflections and adjustments we have made as a research team, grappling with unexpected insights from our data and working to ensure that we free our students' voices from the domination of stereotypes.

Our research project explores the longitudinal study experiences of university science students. Spanning six higher education institutions across the United States, England, and South Africa, we investigated student development over the course of their undergraduate study, focusing on the formation of agency in these students as they traversed these demanding programmes. An initial engagement with Archer's theory on agency and its interplay with structure sent us looking for instances where students were crafting their own paths. These degrees tend to have highly structured curricula, especially in the early years, so it is perhaps unsurprising that we found few examples of agency expressed in this way. Rather we were faced with overwhelming evidence of what seemed like a rather non-agentic response, what we termed "coping". However, further empirical engagement pushed us to rethink the normative assumptions we had derived from this theory, and to reconsider these experiences on their own terms, developing an idea of 'situated agency'. Through this concept we no longer took an isolated concept of agency and tried to find it in our students' lives and experiences. Instead, we closely analysed each student's narrative to see how their words might frame their sense of agency, particularly when understood through their wider experiences.

This type of large-scale qualitative research of higher education pedagogy is not common, and we should heed Phipps' warning that we are heading into an environment that may make such work less likely, at least less likely in the ways that proved so valuable in our work. So we present this research to celebrate and affirm the need for close-up research to also sometimes be relatively large scale. Equally we present our work in light of Macfarlane's warnings: To ensure the ethics, credibility and genuine usefulness of this research rather than playing into yet another performative agenda.

Keywords

Student learning, agency, longitudinal study, comparative study, STEM degrees