Public Abstract

First Name:Christopher

Middle Name:Daniel

Last Name:Murakami

Adviser's First Name:Marcelle

Adviser's Last Name:Siegel

Co-Adviser's First Name:

Co-Adviser's Last Name:

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ABSTRACT

National reform documents suggest that changing pedagogical and assessment practices in college science courses are necessary but challenging steps to help support the formation of science identities. This dissertation is a collection of three separate research manuscripts that examined the challenges and affordances of designing and enacting curriculum and assessment practices in an upper-level agroecology course titled, Advanced Practices of Sustainable Agriculture. All three studies integrate theoretical lenses of situated learning, communities of practice, and identity and agency in cultural worlds to support and describe the process of science identity formation. Five instructors and thirteen students participated in the research process. During the fifteen-week semester in the Fall of 2013, pre/post narrative interviews, weekly instructor planning sessions, weekly classes, student assignments, and course artifacts were collected. Interviews were transcribed and remaining data were then analyzed using NVivo10 software and a variety of qualitative methods. The first research manuscript employs case study methodology to explore the sociocultural tensions within the classroom community of practice. Two ethnographic vignettes were used to describe the nature of four interconnected sociocultural tensions: (1) individual tensions, (2) community tensions, (3) local/global tensions, and (4) local tensions. Attending to these tensions that are inherent in student-centered, democratic learning is central to the wicked problem of agroecology education. The second manuscript aims to expand the purposes of Science, Technology, Engineering, and Math (STEM) education reform to accommodate disciplines like agroecology that is framed as a Feminist – STEM (F-STEM) discipline. Previous research has focused on the science identity gap that exists for women and other non-dominant groups. Despite academic gains in science courses, women and underrepresented learners might still feel as if science is not for them. Using the voices of three women in the course, the study uncovered aspects of Equitable Science Assessment Practices (ESAP) that support the formation of F-STEM Identities. Inspired by the stories and experiences of the three participants, four features of ESAP were characterized using iterative qualitative analysis and poetic representation: (1) allowing flexibility, (2) sharing authority, (3) laminating voices, and (4) scaffolding social justice. These interdependent features of ESAP that focus on identity formation can provide course design principles and present new opportunities to merge critical feminist studies of science education and equitable assessment.

The third manuscript integrated the mapping and tracing of rhizomes with the practice of reflexivity in qualitative research to describe a process of becoming Bermuda Grass, a rhizome encountered and mimicked by the researcher. The study was initiated when a student participant expressed an identity of non-participation in the course. The article provides a narrative account of applying aspects of rhizome theory and reflexivity to gain new meaning and insight to support learners in an agroecology course. These three manuscripts focus on different grain sizes and help make connections between local contexts and global issues of environmental and social justice. This research contributes a new dimension to a framework for the political ecology of education focused on supporting learner identity transformation through classroom assessment practices.