

Characterization of Student and Instructor Behaviors in CURE and Non-CURE Learning Environments: Implications for Non-Cognitive Student Outcomes

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Course-based undergraduate research experiences (CUREs) serve to increase student access to authentic scientific opportunities. Current evidence within the literature indicates that engagement in CUREs promotes students' science identity development, and affect ability to "think like a scientist." Despite the importance of these findings, few studies have examined the behaviors and interactions occurring within CURE and non-CURE settings and the impact of those behaviors on said student outcomes. To address these concerns, we conducted a mixed methods study to explore student and instructor behaviors in four CURE and four non-CURE introductory biology laboratory sections. Representative video data were collected in each section and coded using the Laboratory Observation Protocol for Undergraduate STEM. In addition, pre-/post-semester affective survey data were obtained from CURE (n = 47) and non-CURE (n = 64) participants. Results indicated that CURE students and instructors engaged in more interactive behaviors (e.g., one-on-one dialogue; questioning) than their non-CURE counterparts ($p \leq 0.005$ for all analyses), a finding confirmed by analyzing behavioral patterns via construction of partial correlation networks. Multiple regression analyses further revealed that student/instructor interactive behaviors and enrollment in a CURE were strong predictors of pre-/post-semester shifts in student motivation, science identity development, discovery-based learning, and collaboration.

Keywords: CURE assessment

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