Student persistence in science: Elucidating critical features of undergraduate research experiences

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Engaging in undergraduate research is associated with numerous student outcomes, including increased self-efficacy, persistence in a biology major, and pursuit of a career in science. Course-based Undergraduate Research Experiences (CUREs) increase students’ access to research experience by involving all students enrolled in a course in an active research project. Recent studies describing student outcomes of CUREs help to evaluate CURE efficacy, but do not describe what makes CUREs distinct from other lab learning experiences. Knowledge of the variation in CURE instruction and activities is essential to determine how and why CUREs work in order to inform future course design. Recently, an expert panel theorized that CUREs comprise five course elements. CUREs provide opportunities for students to (1) engage in science practices (e.g., collect and analyze data), (2) make discoveries, (3) engage in work that has relevance outside the classroom, (4) collaborate, (5) and iterate (e.g., revise or repeat experiments). We developed an instrument, the Laboratory Course Assessment Survey (LCAS), intended to measure elements 2 through 5. Data from 213 students in biology courses, including CUREs and traditional labs, were used to characterize the psychometric quality and utility of the LCAS. This talk will discuss the development of this instrument, its psychometric properties, and results from initial data collection in biology laboratory courses. The LCAS can be used to assist and assess laboratory course design and to determine how course design relates to student outcomes.