

Clickers in the Wild: A Campus-Wide Study of Student Response Systems

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Global labor markets increasingly demand professionals with sophisticated skills in science, technology, engineering, and mathematics (STEM; Lansiquot et al., 2011; Vergara et al., 2009). However, too few U.S. college graduates possess these skills (Goldin & Katz, 2009; Levy & Murnane, 2012). Instructional methods in undergraduate STEM courses may be partly to blame. These courses typically take place in large lecture halls in which expert teachers transmit knowledge with minimal student interaction. Several observers argue that this course design contributes to the high level of attrition seen in STEM majors during the early undergraduate years (Baillie & Fitzgerald, 2010; Kyle, 1997; McGinn & Roth, 1999; Mervis, 2010; NAE, 2005). Student response systems (SRS), commonly known as clickers, may improve student outcomes in STEM by facilitating real-time classroom interaction, providing immediate feedback to both students and teachers, and creating opportunities for students to practice solving real-world problems. For this mixed-methods study, we observed 43 courses (enrolling nearly 15,000 students) over two academic terms, conducted 41 instructor interviews, and analyzed institutional data from the University of California, Irvine (UCI). Special attention was given to student outcome measures and instructor implementation strategies. We found that students earn slightly higher grades in courses that use clickers, with heterogeneous effects for females.

Keywords: clickers, lecture courses, persistence, STEM, underrepresented groups