

Title: Measuring the effects of using partially-populated notes in first-year Calculus

Keywords (max 10): partially-populated notes, pedagogy, mathematics, success, retention, shared-writing, peer-learning, survey, qualitative, quantitative

Abstract:

Pedagogical innovation in post-secondary mathematics has not progressed at the same rate as other disciplines. Recent poor results in international standardized testing and a high number of students failing in post-secondary mathematics, among other factors, has created an urgent need to examine post-secondary mathematics pedagogy and innovations in student-centred curricula, assessment and teaching practices (Conference Thread A).

In this research, we explored the use of partially-populated notes (PPNs) in a first-year calculus course. PPNs are lecture notes prepared by the instructor (first author) that have strategically placed empty spaces for students to fill-in during the lecture as an exercise in shared-writing with the instructor. Student data, including mid-term, final exam, and final course result, were compared between two sections of a calculus course (Fall 2014 control class and Fall 2015 where PPNs were used as a pedagogical intervention). The following variables were also considered: entrance averages, courses taken in high school, participation in remediation, lab results, and placement test scores.

A mixed-methods statistical analysis comparing the impact of the PPNs on course-level outcomes as well as the impact of other student-level predictor variables thought to impact achievement in first-year mathematics will be presented and discussed. Results from an exit survey measuring the student experience will also be discussed. We will also share examples of PPNs, and discuss, as a group, the important factors of successful writing in undergraduate mathematics courses. The aim will be to inspire conversation on how innovations in undergraduate mathematics teaching can be utilized.

Elements of Engagement:

In this session, time will be dedicated to discussion (as a group) on the topic of how innovations in undergraduate mathematics teaching can be utilized effectively in the post-secondary classroom. This discussion can be rather open-ended, however, some key aspects to consider would be: 1) How to effectively use class time given alternative teaching methods; 2) Altering teaching methods to meet the needs of the students; 3) a balance of aspects 1 and 2; and 4) The time commitment/pressure placed on course instructors to alter their practice of teaching.