

Supplemental Instruction's Impact on STEM Course Success: A Propensity Score Analysis

Project Summary

This study compared the course success rates among UA students who regularly participated in Supplemental Instruction (SI) for SI-supported STEM courses in fall 2015 to those who did not. Using propensity score analysis, a statistical control group was created for comparing outcomes to SI participants. The results show that:

- Regular participation in Supplemental Instruction increases course success rates, defined as a course grade of A, B, or C, by **15.3 percentage points**.

Data and Methodology

In fall 2015, seven STEM courses were supported by SI: CHEM101A, CHEM101B, CHEM151, MCB181R, PHYS241, PSIO 201, and PSIO 202. For this study, we limited the analysis to students who were enrolled in these courses and received a grade in the course. Success in these courses is important for STEM majors, as completion enables students to move to upper-division courses and ultimately graduate. However, these courses have historically had high DEW rates and can be a major impediment to student persistence and success. **27% of the fall 2015 full-time, first-time freshman cohort were enrolled in at least one of these courses.**

The aggregate enrollment of all seven courses was 4,977; of those students, 2,029 attended SI at least once (40.8%). The average number of sessions attended was 4.5, with nearly 300 students attending ten or more sessions. For analyzing outcomes, program participation status is defined by students' attendance at 3 or more SI regular sessions throughout the semester, totaling 782 students.

A variety of demographic and academic variables were used to create the control group: students' Academic Index (AI) and UA Math Placement Exam scores, ethnic minority status, first-generation status, Pell grant eligibility, residency status, and gender.

Results

Among the matched data set, table 1 shows that there is a **gain of 15.3% in course success** overall for SI participants who came to three or more sessions. This translates to **120 additional ABC course grades** awarded to students in those courses that can be attributed to SI participation.

	Overall
ABC Rate for SI Participants	87.3%
ABC Rate for Non-participants	72.0%
Difference	15.3%*
N for participants/non-participants	782/782

*p<0.001

For further detail on the course grades, Figure 2 shows the distribution of awarded grades in all courses across the two groups; SI participants were more likely to receive a course grade of A, and much more likely to receive a B. Non-participants were more likely to receive all other grades in the course, with the largest difference being in E's and Withdrawals.

Figure 2:

