

Supplemental Instruction’s Impact on 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 CHEM 151 in fall 2015 to those who did not. Additionally, it analyzed the differential impact of SI for female and ethnic minority students in the course. 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 **15.1 percentage points**.
- Regular participation in SI was especially impactful for female and ethnic minority students. The course success rate was **15.7% higher for female students** and **18.7% higher for minority students**.

Data and Methodology

For this study, we limited the analysis to students who were enrolled in CHEM 151 in fall 2015 and received a grade in the course. CHEM 151 is an important initial course in the progression of science and engineering majors. Additionally, over 20% of the new freshman cohort were enrolled in the course, making it important for retention efforts.

CHEM 151 was SI’s largest course served, with 1,061 students from the course using at least one SI regular session or SI exam review session, accounting for 44% of the students in the course. For analyzing outcomes, program participation status is defined by students’ attendance at 3 or more SI regular sessions throughout the semester (N=239). The average number of regular sessions attended for participants was 4, with nearly 100 students attending ten or more sessions. 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 15.1% in course success** overall for SI participants who came to three or more sessions.

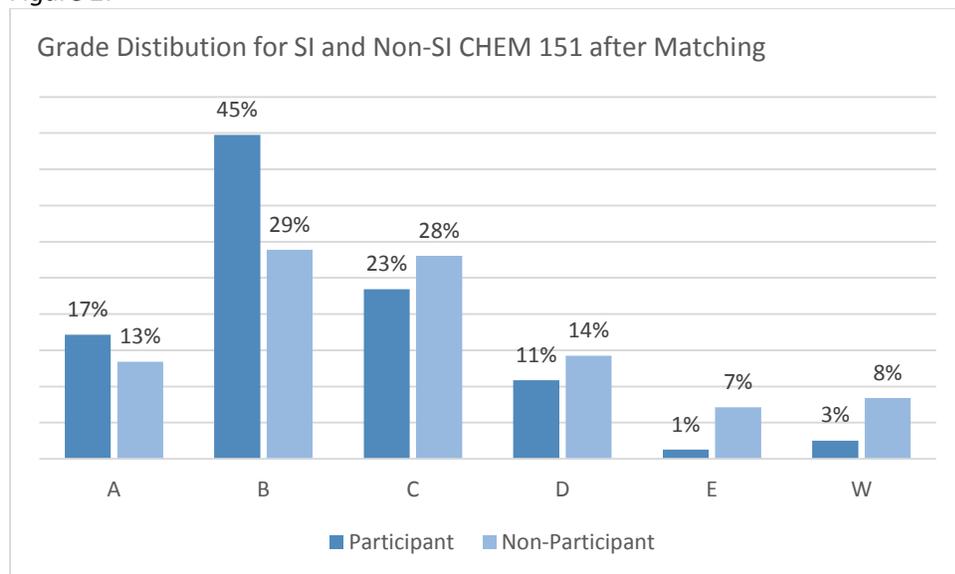
Table 1:
Propensity Score Adjusted Outcomes for SI Participant Populations

	Overall	Females	Males	Ethnic Minority	Non-Minority
ABC Rate for SI Participants	85.40%	83.60%	89.20%	80.90%	89.10%
ABC Rate for Non-participants	70.30%	67.90%	75.30%	62.20%	77.30%
Difference	15.10%**	15.70%**	13.90%*	18.70%**	11.80%*
N for participants/non-participants	239/239	165/165	74/74	110/110	129/129

*p<0.05; **p<0.01

For further detail on the course grades, Figure 2 shows the distribution of awarded grades in CHEM 151 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:



The difference in ABC rates is significant for the group as a whole and also for each demographic subpopulation. As shown in Table 1, the impact of the SI program is larger for female students and for non-white students. The difference for female students was 15.7% and 13.9% for male students. Also, while the impact was significant across all populations, the degree of statistical significance was higher for the female and minority groups. These results indicate that women and ethnic minority students benefited the most from participation in the SI program for CHEM 151.

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