THINK TANK

Supplemental Instruction's Impact on STEM Major Persistence: A Propensity Score Analysis

Project Summary

This study compared the STEM major persistence rates among UA freshmen who regularly participated in Supplemental Instruction (SI) in their first year to those who did not. Additionally, it analyzed the differential impact of SI for under-represented minority STEM students in the cohort. Using propensity score analysis, a statistical control group was created for comparing outcomes to SI participants. The results show that:

- Students who participated in Supplemental Instruction persisted within a STEM major at a rate 14.5 percentage points higher than non-participants.
- Regular participation in SI was especially impactful for URM STEM students. The STEM persistence rate was success rate was 22.9 percentage points higher for URM students who participated in SI than that of non-participants.

Data and Methodology

For this study, we limited the analysis to full-time, first-time freshmen who were enrolled in SI supported courses in fall 2015 or spring 2016 and were in a STEM major. Of the 6,973 students in the freshman cohort, 1,908 declared a STEM major in fall of their first year, comprising 27.4% of the cohort. Of the original 1,908 STEM majors, 1,335 remained in a STEM major in fall 2016 (69.97%). The persistence rate in STEM was lower for under-represented minority students, at 64%.

In the 2015-2016 academic year, 1,265 STEM students from the FTFT freshman cohort were enrolled in a course that was supported by SI; of those, 738 (58.3%) utilized SI at some point in the year. For analyzing outcomes, program participation status is defined by students' attendance at 3 or more SI regular sessions throughout the semester (N=456). The average number of regular sessions attended for participants was 5.9. A variety of demographic and academic variables were used to create the control group: students' Academic Index (AI) and UA Math Placement Exam scores, URM 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 14.5% in STEM persistence** overall for SI participants who came to three or more sessions.

	Overall	URM
STEM Persistence Rate for SI Participants	81.6%	81.7%
STEM Persistence for Non-participants	67.1%	58.8%
Difference	14.5%	22.9%
N for participants/non-participants	456/456	153/153

The difference in STEM persistence rates is significant for the participant group as a whole and also for under-represented minority STEM students. As shown in Table 1, the difference for URM students was 22.9%. These results indicate that under-represented minority STEM students benefited the most from participation in the SI program in terms of persisting in their intended major.

Conclusions

Regular participation in Supplemental Instruction appears to support student success in STEM majors by increasing persistence in the majors from freshman year to sophomore year. Prior analyses have shown the significant positive impact of SI on students' course grades, likely contributing to their ability to continue in difficult academic majors.

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