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The Supplemental Instruction (SI) program at Fresno State helps hundreds of students raise their grades in classes and is impacting student success. However, research has found that students who could benefit the most are least likely to participate.

Developed at the University of Missouri-Kansas City in 1973, **SI targets historically difficult courses by hiring student leaders, who have successfully completed the course, to attend each class**

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meeting and then lead their own weekly study groups. In spring 2013, 15 Fresno State courses were augmented with SI.

At Fresno State, research analyst Hongtao Yue of the Office of Institutional Effectiveness (OIE) evaluated the factors affecting SI participation and the academic performance of “SI students,” defined as those who chose to attend three or more SI sessions.

Yue’s study identified 598 SI students in the spring 2013 courses. **At the end of the semester, the SI students’ course grades were nearly a full letter grade higher than their non-SI classmates,** Yue found after adjusting for various factors. This difference could be enough to turn a student’s D into a C, or a B into an A. In an organic chemistry course, the difference between SI and non-SI students was nearly two full letter grades.

However, the SI students accounted for only 19% of the 3,205 students enrolled in the SI courses. **Students who needed SI the most received the largest benefits from SI but were the least likely to participate,** the study found. For example, students who entered the course with a cumulative GPA below 2.0 were only half as likely to participate in SI as those with a GPA of 3.0 or higher. In addition, students who had failed a course at Fresno State before were less likely to participate in SI than those who had not.

PARTICIPATION RATES

Six factors significantly affected SI participation rates, Yue’s study found. Course instructor/SI leader was the strongest

PARTICIPATION RATES (selected student groups)	
Enrolled in CHEM 8	47.7%
Cumulative GPA of at least 3.0	24.0%
Never failed a course before	22.1%
Average in all SI courses	18.7%

factor. **Classes whose instructors had taught an SI course had higher SI participation rates than those taught by instructors without SI experience.**

Participation rates among the 15 courses varied widely. For example, students in CHEM 8 (Elementary Organic Chemistry) were about 15 times more likely to participate in SI than students in a biology course.



SI student leaders at Fresno State facilitate weekly study groups for hundreds of students enrolled in SI courses. They also meet with instructors to discuss their groups’ progress.

Here are the other five significant factors that affected SI participation rates:

- **English remediation status:** Students who required English remediation were 1.95 times more likely to participate than those who did not require it.
- **Gender:** Female students were 1.66 times more likely to participate than male students.
- **Cumulative GPA group:** Students with a cumulative GPA of at least 3.0 were 1.98 times more likely to participate than those with a GPA below 2.0 – arguably the group that needed SI the most.
- **Failure experience:** Students who had never failed a course were 1.36 times more likely to participate than those who had failed a course.
- **Math remediation status:** Students who required math remediation were 1.29 times more likely to participate than those who did not require it.

EFFECTS ON STUDENT PERFORMANCE

At the end of the semester, SI students’ average grades in their SI courses were 0.54 points higher than those of non-SI students. Furthermore, Yue found that **SI increased average grades by 0.91 points after adjusting for factors such as self-selection,**

considering that students may choose to participate in SI based on difficult-to-measure factors such as motivation. SI students across all cumulative GPA levels earned higher course grades.

GRADE POINT INCREASES (selected student groups)

Enrolled in CHEM 8	1.89
Cumulative GPA below 2.0	1.16
Male	1.03
Average in all SI courses	0.91

Here are two significant factors that moderated the SI effect on course grades:

- **Course instructor/SI leader:** SI significantly increased grades in 11 out of 15 courses, with increases ranging from 0.75 grade points in an introductory biology course to 1.89 in CHEM 8. The four courses without a significant increase were taught by instructors without SI experience.
- **Gender:** SI significantly increased grades by 1.03 points for male students and 0.79 points for female students.

MORE INFORMATION ON SI

- **Fresno State SI program:** <http://www.fresnostate.edu/si>
- **International Center for Supplemental Instruction at the University of Missouri-Kansas City:** <http://www.umkc.edu/asm/si/>