Iowa State University
Dean of Students Office
Supplemental Instruction-Academic Success Center

The Monetary Value of Supplemental Instruction to Iowa State University Due to Reenrollment of SI Participants, FY2014

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Abstract

Academic success is an important factor in students' persistence through college (Tinto, 1987). For a university, academic success equates to retention of students, and retention of students becomes retention of tuition dollars. Results of a national, longitudinal study on student retention showed SI participants from one semester reenrolled the following semester at a rate of 10% higher than peer students who did not participate in SI (Arendale & Martin, 1997).

Two formulas describe the monetary value of SI to universities. These formulas show:

1. The monetary value SI contributed to Iowa State University during FY14 was $3,286,771.
2. To cover all expenses, SI at Iowa State University would need to contribute to the retention of less than .39% of all SI Participants.

Executive Summary

Purpose

This study has two purposes; first, to identify the reasonable financial impact of Supplemental Instruction to Iowa State University. It is not assumed that participation in SI is the solitary reason a student reenrolls at Iowa State University; however, findings from Arendale and Martin (1997) assert that participation in SI contributes to student reenrollment at a rate 10% higher than non-participants. This means SI reasonably contributes to the retention of tuition dollars from 10% of the total SI participants during the semester after the students participated in SI.

The second purpose is to determine the minimal impact SI must have on retention of SI participants in order for SI to pay for itself.

Definitions

A "cohort" of students for this study is defined as the group of students who first enrolled at Iowa State University during one specific term (fall, spring, or summer) of a specific year.

The "breakeven" rate for SI is calculated based on the minimum number of SI participants that must be retained at Iowa State University in order for the SI expenses to be covered.

A student is an "SI participant" if s/he participates in one or more SI sessions for any one course s/he is enrolled in. A student is a "non-participant" if s/he does not participate in SI sessions for a course.

Methodology

Data continuously collected by the SI program staff provides us the means to track longitudinal information, and the Iowa State University fact book provides the history of tuition costs at the university.

The following variables are being used in the calculations:

Variable	Description
N_i	Number of SI Participants from one cohort participating in SI during semester *i*.
r	Difference in the rate of reenrollment in SI participants versus non-participants, from semester *i-1* to semester *i*. For example, fall 2002 SI participants who reenroll during the spring 2003 semester. (For purposes of this report, $r = 10\%$ for all semesters.)
n_i	Number of SI Participants retained at ISU in semester *i* based on participation in SI during the previous semester *(i-1).* Also, $n_i = rN_{i-1}$

Variable	Description
T_i	Cost of tuition during semester *i*. For purposes of this report, T_i is based on the full-time undergraduate in-state tuition excluding any fees or differential tuition rates.
$M_{i,k}$	Monetary value of SI to Iowa State University for semester *i* for one cohort *k*.
E_j	Total value of expenses for SI during year *j*.
B_j	Break even rate for year *j*.

Formula A: Total Value of SI

The first outcome sought using these variables is a dollar amount expressing the total contribution of SI for any semester *i* from one cohort *k*. Using a formula created by Congos (2000), the impact of SI for one semester for one cohort is based on the following equation:

$$M_{i,k} = (n_i) * (T_i)$$

For example, consider the cohort of students first enrolling at Iowa State University in fall 2013. From this cohort, 3089 students participated in SI during the fall 2013 semester. The monetary impact of 10% of these students reenrolling at Iowa State University for the spring 2014 academic term, results in

$$M_{s14,f13} = (n_{s14}) * (T_{s14}) = (308.9) * (\$3324) = \$1{,}026{,}784$$

This means that retaining 10% of the fall 2013 cohort members who were also SI participants during the fall 2013 semester contributed to $1,026,784 in spring 2014 tuition dollars. To understand the overall value in tuition dollars for the spring 2014, based on reenrollment of SI participants from prior semesters, simply sum the monetary value of SI participants from each cohort, as follows:[1]

$$M_{s14,f02\rightarrow f13} = \left((n_{f02}) + (n_{s03}) + \ldots + (n_{f13})\right) * (T_{s14}) = \$1{,}963{,}819$$

in retained tuition during spring 2014. Similarly, the value of SI for FY14 is the sum of retained tuition in fall 2013 and spring 2014, which is $3,286,771.

Formula B: The Break Even Point for SI[2]

An alternative allows us to use the annual expenditures for SI in a simpler formula that discovers a "breakeven" rate. This rate is based on the minimum number of SI Participants (from semesters N_i and N_{i+1}, where *i* and *i+1* correspond to the two semesters in academic year *j*) that need to reenroll the semester after being an SI participant. The break even point is simply:

$$N_j = \frac{E_j}{T_j}$$

For example, for the academic year 2013-2014, we have:

$$N_{2013\text{-}2014} = \frac{E_{2013\text{-}2014}}{T_{2013\text{-}2014}} = \frac{\$264{,}274}{\$6648 / student} = 40 \text{ students}$$

Hence, SI theoretically paid for itself for FY13 by contributing to the reenrollment of 40 students. This minimal baseline is easily achieved—during the 2013-2014 school year, this means contributing to the retention of 0.39% of our SI participants.

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[1] Note that in this formula, the monetary value for any given semester is based on participating in SI during the preceding semester only. This formula does not include SI participants from prior semesters.

[2] Expenses for SI have been tracked, and corresponding budget data are available for fiscal years FY03 through FY14. Please note that expenditures are tracked by fiscal year, and not tracked by semester.

Findings

The Total Value of SI

Table 1 calculates how SI contributes to tuition dollars via reenrollment for all cohorts and semesters from fall 2002 through fall 2014. As shown, SI contributed to retaining $3,276,771 in tuition dollars during FY2014. For all cohorts this data have been tracked, SI has contributed to retaining $20,448,909 in total tuition dollars for the fiscal years FY2003 through FY2014, which is a 796% return on actual investment in SI.

To address cost effectiveness, consider the amount of funding going into the SI program. During FY2014, $264,274 covered all program and staffing expenses for SI. Hence, for FY2014, the value of reenrollment tuition is over eleven times the amount of money put into the SI program.

The Break Even Point for SI

In order to have SI pay for itself, data in Table 2 shows that SI must contribute to the retention of less than 0.5% of the SI participants on an annual basis since FY2009. This rate is easily and realistically attainable, and is also much less than Arendale & Martin's (1997) published rate of 10%.

Discussion and Recommendations

The results show the cost effectiveness of SI increases with improved program effectiveness and tuition increases. Recently, with tuition rates frozen, SI is still worth more to the university because:

- Participation rates remain high, and
- SI impacts retention beyond just the one semester tracked in this assessment.

This project also predicts the impact of other changes to the program. These changes and predicted outcomes are outlined in Table 3. Due to our history of tracking data, these predictions have remained unchanged for many semesters.

For Further Research

Critics have continued to point out that we have not shown that SI participants reenroll at a rate 10% higher than non-participants. Due to data management complexity, we continue to be unable to determine an exact percent of students who have reenrolled, but even the most ardent critic must agree that SI easily contributes to retention of the break-even rate.

References

Arendale, D. R., & Martin, D. (2001). *Review of research concerning the effectiveness of Supplemental Instruction from the University of Missouri-Kansas City and other institutions across the United States.* Kansas City, MO: The University of Missouri-Kansas City.

Congos, D. (2001). How Supplemental Instruction (SI) generates revenue for colleges and universities. *Journal of College Student Retention, 3*(3), 301-309.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: University of Chicago Press.

TABLE 1: Monetary value of SI, by Semester and Cohort.

The complete table is now too large to fit in this document at a readable size. Please see the file: H:\Supplemental Instruction\Longitudinal\Reports\Financing SI\ SI Impact on ISU.xlsx

TABLE 2: Calculations of the "Break Even" Rate for SI, by Fiscal Year.

Year	Annual Program Allocations	Annual Tuition	Required Retention Count to Break Even, based on Tuition	Count of SI Participants	Required Retention Rate to Break Even, based on SI Participation
2002-03	$161,801	$3,692	44	5046	0.87%
2003-04	$169,250	$4,342	39	5020	0.78%
2004-05	$173,183	$4,702	37	4327	0.85%
2005-06	$177,772	$4,890	36	4312	0.84%
2006-07	$178,648	$5,086	35	4654	0.75%
2007-08	$160,973	$5,352	30	5374	0.56%
2008-09	$176,486	$5,524	32	6892	0.46%
2009-10	$177,204	$5,756	31	6808	0.45%
2010-11	$198,287	$6,102	32	7333	0.44%
2011-12	$216,990	$6,408	34	7842	0.43%
2012-13	$227,076	$6,648	34	9515	0.36%
2013-14	$264,274	$6,648	40	10307	0.39%

TABLE 3: Potential changes to the SI Program, and projected impacts of these changes.

Potential Change	Rationale for Change	Impact of change on				Financial Impact
		Students	SI Leaders	SI Supervisors	Instructors	
Increasing the number of SI Leaders	To expand SI to more courses or more sections.	More support where needed.	Minimal change for the group of Leaders.	Less support to individual SI Leaders.	More instructors receive the support of SI.	Every $1800 in funding increase is another SI Leader.
Adding another SI Supervisor	To provide more support for SI Leaders.	May notice minimal change.	Receive more direct support from SI Leaders.	More time to directly connect with SI Leaders and instructors.	More time for supervisors to connect with instructors.	An additional 20-hour Graduate Assistant is approximately $15,000.
Decreasing overall SI funding	Budget cuts or reversions	SI for fewer courses and/or higher Student-to-Leader ratio	Fewer SI Leaders overall; each Leader may be targeting a larger group of students.	More time to spend with individual SI Leaders.	Fewer instructors would have SI available for their course(s).	Every $1800 in funding decrease is one Leader lost.
Adding SI Sessions (5-6 per week, rather than 3)	A cheaper solution to reaching more students than adding another full SI Leader.	More sessions offered; may increase likelihood of being able to participate. No change to the number of courses with SI.	May make some SI Leader candidates ineligible (too many work hours). Time spent in class and planning for one session could be "reused" for more sessions.	Minimal impact.	Minimal impact.	Approximately $150 for one Leader to add one session per week, for an entire semester.
Increase the SI Leader wages.	To make position more competitive, and attract stronger students. Also, no increase for past six years.	May notice minimal change.	Increased reward for effort.	Will improve recruitment and retention of SI Leaders.	Minimal impact	$80 per semester for every $.50 hourly raise per Leader.