

The Lesser of Two Evils? Required vs. Voluntary SI and the Effects on Attrition, Student Self-Efficacy, and Motivation



Welcome!

6th International Conference on Supplemental Instruction

TEXAS  STATE
UNIVERSITY
SAN MARCOS

Why are you here today?

- We're considering doing this at my campus.
- I'd like to pilot something like this at my campus.
- Insert Administrative Title is telling me I must do this at my campus.
- I've heard animated discussion of the topic and was curious.
- Others?

Why the controversy?

- Upholding the Model
- Removing student choice
- Logistics: where and when to hold sessions
- Changing the dynamic of session?
- Others?

Why are we here today?

- To discuss what we feared would happen, what actually happened / is happening, and what we've learned about along the way

Was there controversy on our campus?

- Controversy is a strong word. Anxiety?
- Like many, I believe (Lindley talking here) in the model and a certain level of purity.
- Assoc. Provost: Everyone must be fully on board to proceed.



Make every door an open door!

(Very) Brief History of SI at Texas State



- **Begun in Fall 1993 with internal grant (ENG/BIO, 6 sections / 4 SI Leaders)**
- **Continued in Fall 1994 with two Internal Retention Incentive Grants (HIST/MATH, 8 sections, 19 SI Leaders, 30 sessions/week)**
- **In and out of many courses and disciplines including Accounting, Biology, Chemistry, Economics, Finance, History, Honors, Math, Physics, & Statistics**
- **New program leadership in 2005**
- **Stable SI Presence in History (funded by department Fall 1995-present) & Chemistry (continuous grant funding Fall 2005-present)**
- **Mandatory vs. Voluntary CHEM SI began in Fall 2007**

Arguments for or against at Texas State?

- **Neither / Both:** Serious levels of student attrition in College of Science requiring some sort of action by administration
- **Pro:** Potential source of hard line funding should research bear academic fruit
- **Con:** Inability to predict problems based on previous experience (boldly going where we've not gone before makes Lindley nervous)
- **Con:** Logistics and potential problems of running simultaneously voluntary and mandatory programs on one campus.
- **Pro:** Potential source of hard line funding (did we say that already?)



Bottom Line: The students need help. We need to provide some.

Snapshot of SI at Texas State in FY 2010

Fall 2009

Discipline	Sections	Leaders	Sessions/wk	Enrollment	Funding Source
Chemistry	12	12	39 (12M)	992	Provost
History	19	25	75	2,679	History
Other*	9	4	12	1,572	Athletic Academic Center
Total	40	41	126	5,243	\$49,987.12 wages

Spring 2010

Discipline	Sections	Leaders	Sessions/wk	Enrollment	Funding Source
Chemistry	9	8	30 (12M)	635	Provost
Economics	1	1	3	240	SLAC Pilot
History	13	19	56	2,275	History
Other*	10	4	12	968	Athletic Academic Center
Total	33	32	101	4,118	\$32,745.25 wages

FY 2010 Total	73	73	114 (avg)	9,361	\$82,732.37 wages
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*Other: Geography, Math, Philosophy, & Political Science

[Schedule Snapshot](#)

National Science Foundation Grant Highlights

- 2005-2007: Internal Grant for On-Sequence General Chemistry
- 2006-2008: Internal Grant for On-Sequence Organic Chemistry
- NSF Proposals Submitted in 2006, 2007, 2008, and 2009
- NSF Research Grant funded for FY 2011-2013

Involves Personnel From

- Department of Chemistry & Biochemistry (College of Science)
- Department of Education Administration & Psychological Services (College of Education)
- Student Learning Assistance Center (University College)
- Testing, Research Support, & Evaluation Center (University College)
- Registrar's Office

Other Highlights

- SI Salaries supported by the administration, not by the grant (commitment of the university to the program)
- Supported by all affected faculty in the Department of Chemistry and Biochemistry (both M and V faculty)



Specific Objectives of NSF Research Project:



- 1) Determine if the success of SI program is a result of student self-selection
general self-efficacy survey & chemistry self-efficacy survey
- 2) Evaluate the variables which can be utilized to predict the degree of success of the SI program for a particular student, and
grade point average; DFW rate; gender, ethnicity, desired major; mathematics background; SAT or ACT scores; and status as a first-generation student.
- 3) Assess the effect of the SI program on student success in subsequent courses offered by the Department of Chemistry and Biochemistry and retention of the students within STEM majors.
longevity study where the success of each student is tracked through the subsequent chemistry and biochemistry courses and the retention of the students within STEM majors is monitored

Logistics

Getting Started

▪ Big THANKS to Anne Raines and Lorraine Brewer at the University of Arkansas for sharing their Case Study at the 2008 SI Conference in Orlando!

Picking Leaders

- Recruitment by email, flyers, faculty recommendation, in-class announcements, and outstanding Chemistry student standing
- Perspective SI Leaders submit application requiring 2 faculty recommendation signatures and a transcript (required 3.0, preferred 3.2 GPA; of Spring 2010 SIs, avg 3.60 and median 3.70 GPA)
- Applicants are interviewed (approximately 30 minutes each) by SI Coordinator & Chemistry Faculty



Spring 2010 Awards Banquet

Training & Supervision

- SI Leaders undergo 16 hours of pre-semester training and 4 ongoing training sessions/semester (about 1 every 3-4 weeks)
- Training integrates all SI disciplines
- Meet & Greet mixer with CHEM SIs and CHEM Faculty prior to first class day (difficulty scheduling & with attendance)
- SI Leaders are asked to meet individually with their assigned faculty on a regular basis (but this is difficult to track)
- First year (F2007-S2008): Weekly meetings with all SI Leaders & Dr. Feakes
- Second year (F2008-S2009): Bi-weekly meetings with all SI Leaders & Dr. Feakes
- Third year (F2009-S2010): TRACS Forum with incentives
- Each SI Leader (both M & V) uses TRACS site (equivalent to Blackboard) to communicate with students / faculty, post handouts, etc.

Identifying Sections as M or V

- 3 sections are designated as Mandatory
- Remaining sections are voluntary (sessions scheduled by survey)
- M sections require student registration in one session in addition to lecture
- M session times determined by CHEM Faculty and SLAC Staff and posted in schedule of classes prior to registration periods
- Effort made to have M faculty teach 1 V section (for comparison)

CHEM 1341 GENERAL CHEM 1 (Prerequisites)

366075	002	MWF 10-10:50 am	CHEM 100	Feakes	8/25-12/15	40
MUST TAKE ONE STUDY SESSION 1005-1008						
366076	003	MWF 11-11:50 am	CENT 100	Compton	8/25-12/15	20
366067	1005	U 5-5:50 pm	ALK 408	Feakes	8/25-12/15	20
MUST CONCURRENTLY TAKE CHEM 1341.002						
366068	1006	W 8-8:50 am	ALK 408	Feakes	8/25-12/15	20
MUST CONCURRENTLY TAKE CHEM 1341.002						
366069	1007	H 11-11:50 am	ALK 408	Feakes	8/25-12/15	20
MUST CONCURRENTLY TAKE CHEM 1341.002						
366070	1008	F 12-12:50 pm	ALK 408	Feakes	8/25-12/15	20
MUST CONCURRENTLY TAKE CHEM 1341.002						

Left is an example of what appears in schedule of classes

Getting The Word Out on the Street...

The Syllabus

- CHEM Faculty do not work from a common syllabus but do have a standardized final exam
- All M CHEM Faculty agree to include program info in their syllabus
- All M CHEM Faculty agree to award a small percentage (5-8%) of their total course grade for M Session attendance & participation

The First M Session

- Program administrator appears at all first M sessions to explain purpose of research, grading rubric, etc.

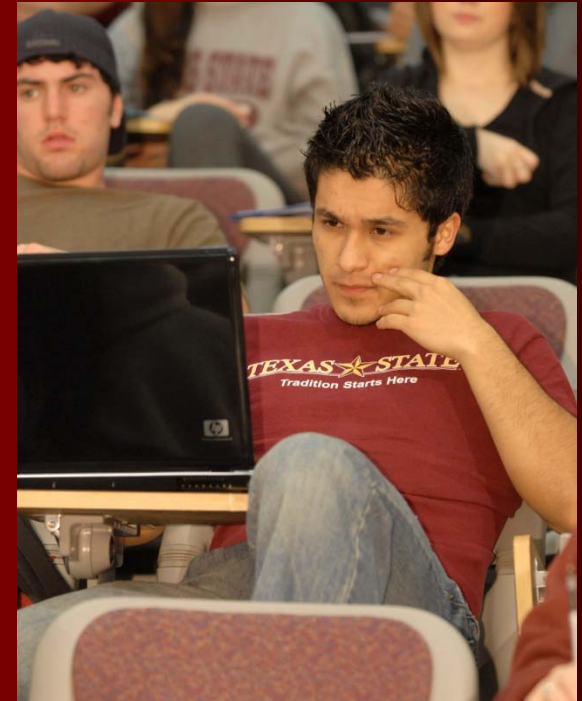


The “Grading”

- SI Leaders keep attendance records normally and provide a separate spreadsheet for their assigned faculty
- Students receive 5 pts per session (1 for being on time, 2 for staying 50 mins, 3 for playing well with others)
- Drop lowest 3 grades (3 “free” absences)

How is M different from V session?

- SI Perspective: more paperwork for M SI, some “attitude” issues in both M and V
- Faculty Perspective
- SI Administrative Perspective: Scheduling



**Mandatory Session is STILL SI!!! Same Premise.
Same philosophy. Same training.**

So what do the students REALLY think?

- “SI leaders were good, but I don't believe that SI should be mandatory. Mandatory sessions don't foster learning.”
- “I enjoyed the SI sessions, it was a calm environment that helped me learn a difficult topic.”
- “SI should not be mandatory. The sessions when there was material that we covered in class were fantastic. However, being required to attend directly after a test is terrible.”
- “I like how SI sessions counted towards our overall course grade.”
- “I feel that an SI should not be required for students who are doing well in the course. Maybe after a student's average drops below a certain point, then it will become mandatory.”
- “SI was really helpful and did a good job in helping people and study for classes.”

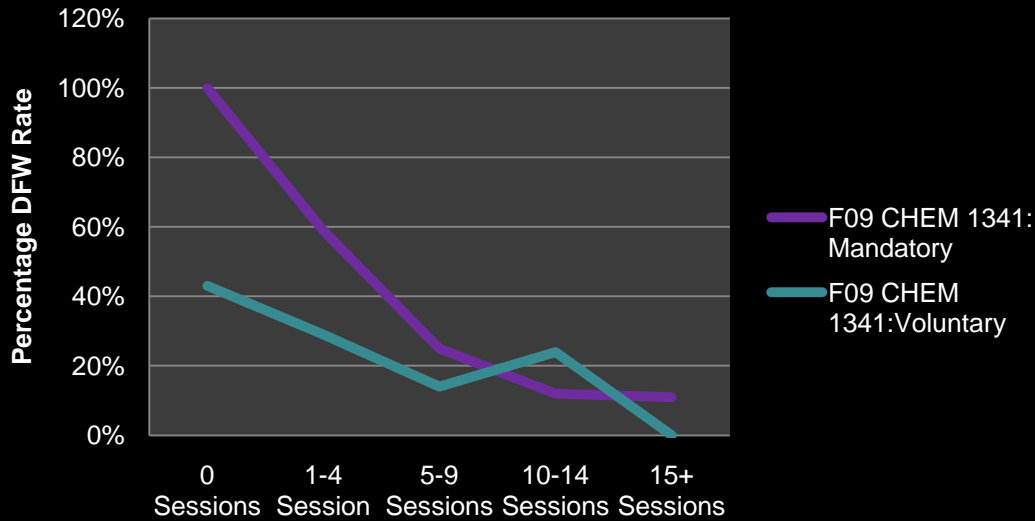


End of Term Survey Question: Please provide any feedback you may have for your SI Leader, including how we might improve the SI program and sessions. All responses from Mandatory section surveys in several semesters.

Student Motivation for Choosing M or V Section

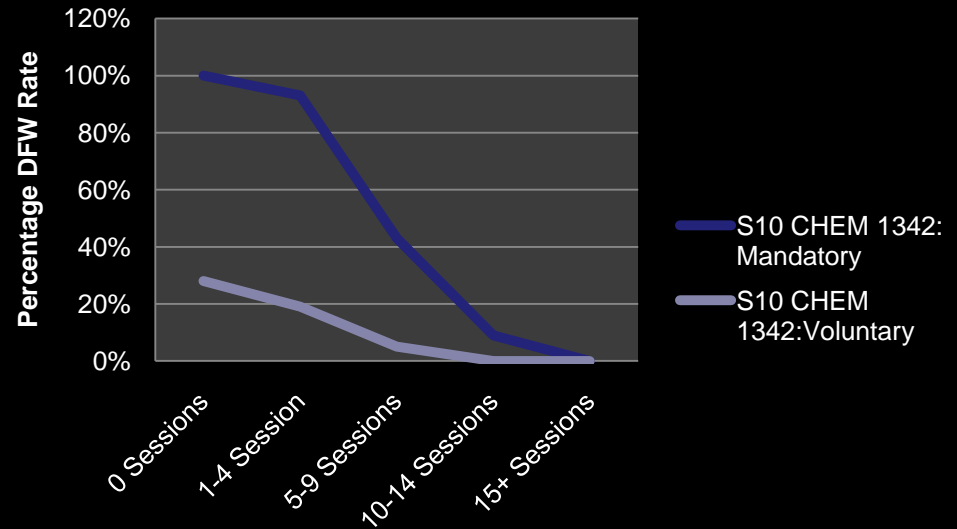
Reasons Enrolled in Selected Section of CHEM 1341	
	Frequency
Scheduling (class times and/or days.)	399
Other sections were already closed.	50
Other reason not listed.	31
Class instructor.	24
This section had supplemental instruction (SI) and that was important to me.	14
My friends were signed up for this section.	8
This section did not have Supplemental Instruction (SI) and that was important to me.	4

Fall 2009 M vs V Comparison



The Basic Data

Spring 2010 M vs V Comparison



Participation & Contact Hours

Program Participation		
	Fall 2009	Spring 2010
Aggregate	39%	35%
Chemistry 1341-1342 (M)	94%	96%
Chemistry 1341-1342 (V)	50%	44%
Chemistry 1341-1342	62%	69%
Chemistry 2341-2342	51%	57%
Economics 2301	NA	43%
Geography 1310	47%	16%
History 1310	45%	32%
History 1320	29%	31%
Math 1315	28%	45%
Philosophy 1320	54%	50%
Political Science 2310	6%	9%

Contact Hours		
	Fall 2009	Spring 2010
Aggregate	10,893	7,352
Chemistry 1341-1342 (M)	2,356	2,231
Chemistry 1341-1342 (V)	837	388
Chemistry 1341-1342	3,513	2,773
Chemistry 2341-2342	760	523
Economics 2301	NA	373
Geography 1310	371	63
History 1310	3,945	1,193
History 1320	1,037	1,486
Math 1315	471	273
Philosophy 1320	714	584
Political Science 2310	82	84

Fall 2009: CHEM 1341 & 2341, No ECO data available;

Spring 2010: CHEM 1342 & 2342;

Attendee vs. Non-Attendee GPA

Attendee GPA		
	Fall 2009	Spring 2010
Aggregate	2.57	2.65
Chemistry 1341-1342 (M)	2.56	2.36
Chemistry 1341-1342 (V)	2.43	2.69
Chemistry 1341-1342	2.50	2.48
Chemistry 2341-2342	2.29	2.07
Economics 2301	NA	3.10
Geography 1310	3.34	2.92
History 1310	2.34	2.57
History 1320	2.68	2.69
Math 1315	2.49	1.46
Philosophy 1320	3.34	3.38
Political Science 2310	3.51	3.28

Non-Attendee GPA		
	Fall 2009	Spring 2010
Aggregate	2.29	2.33
Chemistry 1341-1342 (M)	0.25	0.00
Chemistry 1341-1342 (V)	1.89	2.39
Chemistry 1341-1342	1.95	2.29
Chemistry 2341-2342	1.55	1.30
Economics 2301	NA	2.64
Geography 1310	3.12	2.95
History 1310	1.81	2.03
History 1320	2.07	2.00
Math 1315	2.09	1.21
Philosophy 1320	2.27	2.97
Political Science 2310	3.21	3.02

Fall 2009: CHEM 1341 & 2341, No ECO data available;
 Spring 2010: CHEM 1342 & 2342;

GPA Differential & DFW Rate

GPA Comparison (Att vs. Non-Att)		
	Fall 2009	Spring 2010
Aggregate	0.28	0.33
Chemistry 1341-1342 (M)	2.31	2.36
Chemistry 1341-1342 (V)	0.54	0.30
Chemistry 1341-1342	0.55	0.19
Chemistry 2341-2342	0.74	0.77
Economics 2301	NA	0.46
Geography 1310	0.22	-0.02
History 1310	0.53	0.54
History 1320	0.61	0.69
Math 1315	0.40	0.25
Philosophy 1320	0.56	0.41
Political Science 2310	0.30	0.25

DFW Comparison (Att vs. Non-Att)		
	Fall 2009	Spring 2010
Aggregate	-12%	-13%
Chemistry 1341-1342 (M)	-75%	-72%
Chemistry 1341-1342 (V)	-18%	-14%
Chemistry 1341-1342	-20%	-12%
Chemistry 2341-2342	-32%	-30%
Economics 2301	NA	-9%
Geography 1310	-7%	+13%
History 1310	-20%	-20%
History 1320	-19%	-25%
Math 1315	-19%	-15%
Philosophy 1320	-16%	-11%
Political Science 2310	-6%	-5%

Fall 2009: CHEM 1341 & 2341, No ECO data available;

Spring 2010: CHEM 1342 & 2342;

More Research Highlights...

- Self Efficacy (General & Chemistry) survey is administered via TRACS within the first two weeks and again in the last two weeks of the semester
- Some faculty award students extra credit points as incentive to complete survey (for ex., 2 points added to an exam)

So, what does the data show us (so far)???

- SI attendance strongly increases letter grade but not Chemistry Self-Efficacy
- People with High School Chemistry averaged almost a letter grade higher than those without High School Chemistry
- Gender is not a significant predictor of letter grade
- High Chemistry Self-Efficacy often predicts strong performance on standardized final exam
- Chemistry Self-Efficacy & Gender are biggest predictors of student progression in Chemistry coursework
- Males are 2.5 times more likely to continue in subsequent CHEM course
- SI attendance, Instructor, Course Grades, & Ethnicity were not a significant predictor of likelihood to continue in subsequent Chemistry coursework

Thank you for coming!

Questions? Continued conversation?

Let's stay in touch!

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