Embedded Tutoring Through Supplemental Instruction

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Supplemental Instruction Leaders
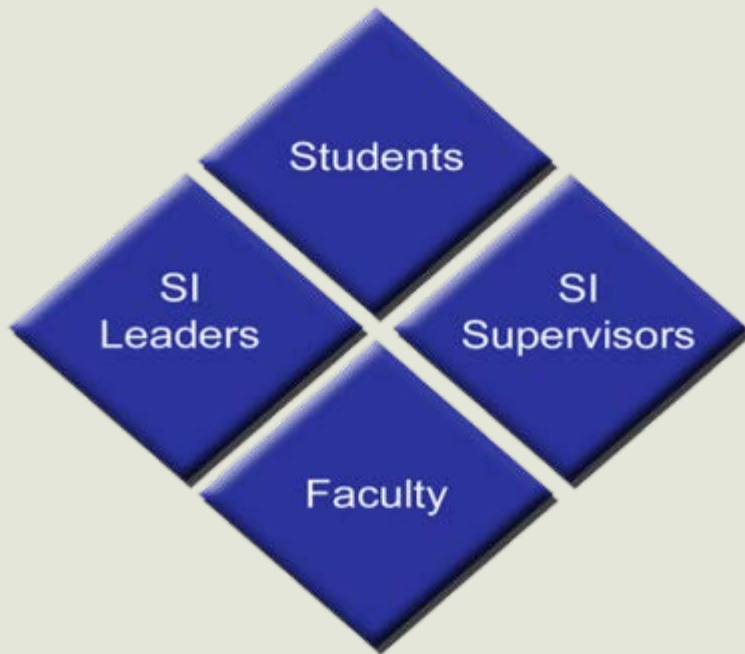Supplemental Instruction Mentors

University of Houston-Downtown
Supplemental Instruction Program

University of Houston-Downtown

- Founded in 1974

- 14,231 enrolled students

- Commuter campus

- Hispanic-serving institution

- Average student age: 28

- Average class size: 26

- Five colleges

Supplemental Instruction (SI)

- History
  - Developed in 1973 by Deanna Martin
  - University of Missouri-Kansas City

- UHD
  - Learner's Community
  - Spring 2001: 20 SI Leaders, 9 courses, 27 sections
  - Spring 2017: 39 SI Leaders, 27 courses, 57 sections

- Objective
  - Target historically difficult courses
  - Improve understanding of course material
    - Improved grades
    - Increased retention
    - Improved graduation rates
  - Build study groups
  - Foster critical thinking
  - Strengthen positive study habits

How does Supplemental Instruction Work?

- Traditional format
  - In-class: model student
  - Out-of-class: collaborative study sessions
    - Twice a week
    - Free, voluntary
  - 1-2 weekly planning hours
  - Communication with instructor

- Other Responsibilities
  - 2-day training
  - Monthly professional development meetings
  - Observations
  - Mentors
  - Performance evaluation

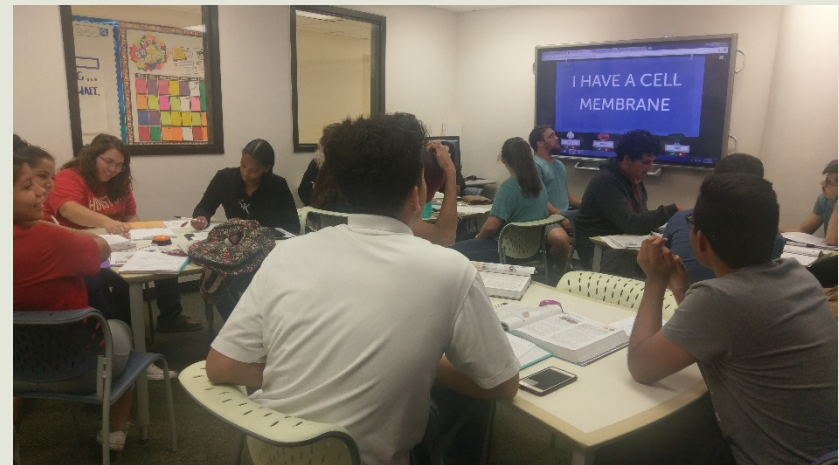Figure 2. History 1305 Session (Charades), Fall 2016

Figure 3. Biology 1301 Session (Jeopardy), Fall 2016

Who are SI Leaders?

- UHD students
  - Taken and mastered the course (B or higher)
  - Minimum 3.0 cumulative GPA
  - Faculty recommendation (required)
  - SI Leader recommendation (desirable)
  - 3-part hiring process
    - Online application
      - Oral Written communication skills
    - Mock session
      - communication skills
      - Personality
      - Performance under stress
    - One-on-one interview
      - Professionalism
  - Trained in:
    - Customer service
    - Title IX
    - FERPA
    - Blackboard

Figure 1. SI Leader cohort, Fall 2016

Staffed Courses

- Human Biology
- *General Biology I*
- *General Biology II*
- *General Physics I*
- *General Physics II*
- *General Chemistry I*
- *General Chemistry II*
- *Organic Chemistry I*
- Physical Geology and Laboratory
- Historical Geology

- Microeconomics
- Macroeconomics
- Federal Government
- U.S. History I
- U.S. History II
- Texas History

- Beginning Algebra
- Intermediate Algebra
- *College Algebra*
- Trigonometry
- Finite Math
- Business Calculus
- Math for Liberal Arts
- Pre-Calculus
- *Calculus I*
- Calculus II

Non-traditional redesigned course

MATHEMATICS

Monday			Tuesday			Wednesday			Thursday		
0300/1310	10:00-11:00	Moises	0300/1310	3:00-4:00	Moises	0300/1310	10:00-11:00	Moises	0300/1310	3:00-4:00	Moises
1300/1301	3:15-4:15	Zia	1300/1301	3:15-4:15	Zia	1300/1301	3:15-4:15	Zia	1300/1301	3:15-4:15	Zia
1301	3:00-4:00	Vicente	1301	9:00-10:00	Winona	1305	1:00-2:00	Alicia	1301	9:00-10:00	Winona
1305	1:00-2:00	Alicia	1302	2:30-3:30	Kaleab	1305/1306	2:30-4:30	Emmanuel	1302	2:30-3:30	Kaleab
1305/1306	2:30-4:30	Emmanuel	1305	2:30-3:30	Alicia	1404	3:00-4:00	Julio	1305	2:30-3:30	Alicia
1404	3:00-4:00	Julio	1306	1:00-3:00	Gina	1505	9:00-10:00	Vicente	1306	1:00-3:00	Gina
1505	9:00-10:00	Vicente	1310	2:30-3:30	Niikky	2401	9:00-10:00	Julio	1310	2:30-3:30	Niikky
2401	9:00-10:00	Julio	2401	1:00-2:00	Yazmin	2401	3:30-4:30	Yazmin	2401	1:00-2:00	Yazmin
2401	3:30-4:30	Yazmin				2402	2:30-3:30	Ignasio			
2402	2:30-3:30	Ignasio									

GEOLOGY

Monday		
1306	1:00-2:00	Emilia
Wednesday		
1305	1:15-3:15	Michael
1306	1:00-2:00	Emilia
Friday		
1305	10:00-11:00	Michael

SI Spring 2017 SESSION TIMES ROOM S-405

OPEN LABS

Friday

CHEM Open Lab
12:00-5:00

MATH Open Lab
1:00-6:00

BIOL Open Lab
1:00-2:00

PHYSICS

Monday		
1307	2:00-3:00	Nelson
1307	4:00-5:00	Robert
Tuesday		
1308	1:00-2:00	Kiara
Wednesday		
1307	11:00-12:00	Nelson
1307	4:00-5:00	Robert
Thursday		
1308	1:00-2:00	Kiara

BIOLOGY

Monday			Tuesday		
1301	4:00-5:00	Rajni	1301	11:00-12:00	Nelson
1302	10:30-11:30	Chris	1301	12:00-1:00	Stephaine
1302	3:50-4:50	Anna	1302	9:15-10:15	Leslie
Wednesday			**Thursday**		
1301	4:00-5:00	Rajni	1301	11:00-12:00	Nelson
1302	10:30-11:30	Chris	1302	9:15-10:15	Leslie
1302	3:50-4:50	Anna	1310	9:30-11:30	Aaron

CHEMISTRY

Monday			Tuesday		
1307	1:00-2:00	Scott	1307	1:00-2:00	Dionesia
1307	4:00-5:00	Lily	1308	8:50-9:50	Ashley
3301	2:30-3:30	Renee	1308	11:00-12:00	Bryttanni
Wednesday			1308	3:50-4:50	Trung
1307	9:00-10:00	Dionesia	**Thursday**		
1307	1:00-2:00	Lily	1308	8:50-9:50	Ashley
1307	4:00-5:00	Scott	1308	3:50-4:50	Trung
1308	11:30-12:30	Bryttanni	3301	1:00-2:00	Irvin
3301	1:00-2:00	Irvin	3301	2:30-3:30	Renee

ECONOMICS

Monday		
2301/2302	11:30-12:30	Thomas
Tuesday		
2301/2302	2:30-3:30	Thomas
Wednesday		
2301/2302	11:30-12:30	Thomas
Friday		
2301/2302	5:00-6:00	Thomas

HISTORY & POLITICAL SCIENCE

Monday			Tuesday cont'd			Thursday		
1305	2:30-3:30	Carlos	1306	1:00-2:00	Francisco	1305	11:30-12:30	Courtney
1305	4:00-5:00	Courtney	1306	2:30-3:30	Juanira	1305	12:00-1:00	Cristal
1306	1:00-2:00	Francisco	2305	2:00-3:00	Cristal	1305	1:00-2:00	Armita
1312	2:00-3:00	Francisco	**Wednesday**			1305	2:30-3:30	Carlos
Tuesday			1305	2:30-3:30	Carlos	1305	3:30-4:30	Katy
1305	11:30-12:30	Courtney	1305	4:00-5:00	Courtney	1306	1:00-2:00	Francisco
1305	12:00-1:00	Cristal	1306	12:00-1:00	Juanira	2305	2:00-3:00	Cristal
1305	1:00-2:00	Armita	1306	1:00-2:00	Francisco	**Friday**		
1305	2:30-3:30	Carlos	1312	2:00-3:00	Francisco	1305	9:00-10:00	Katy
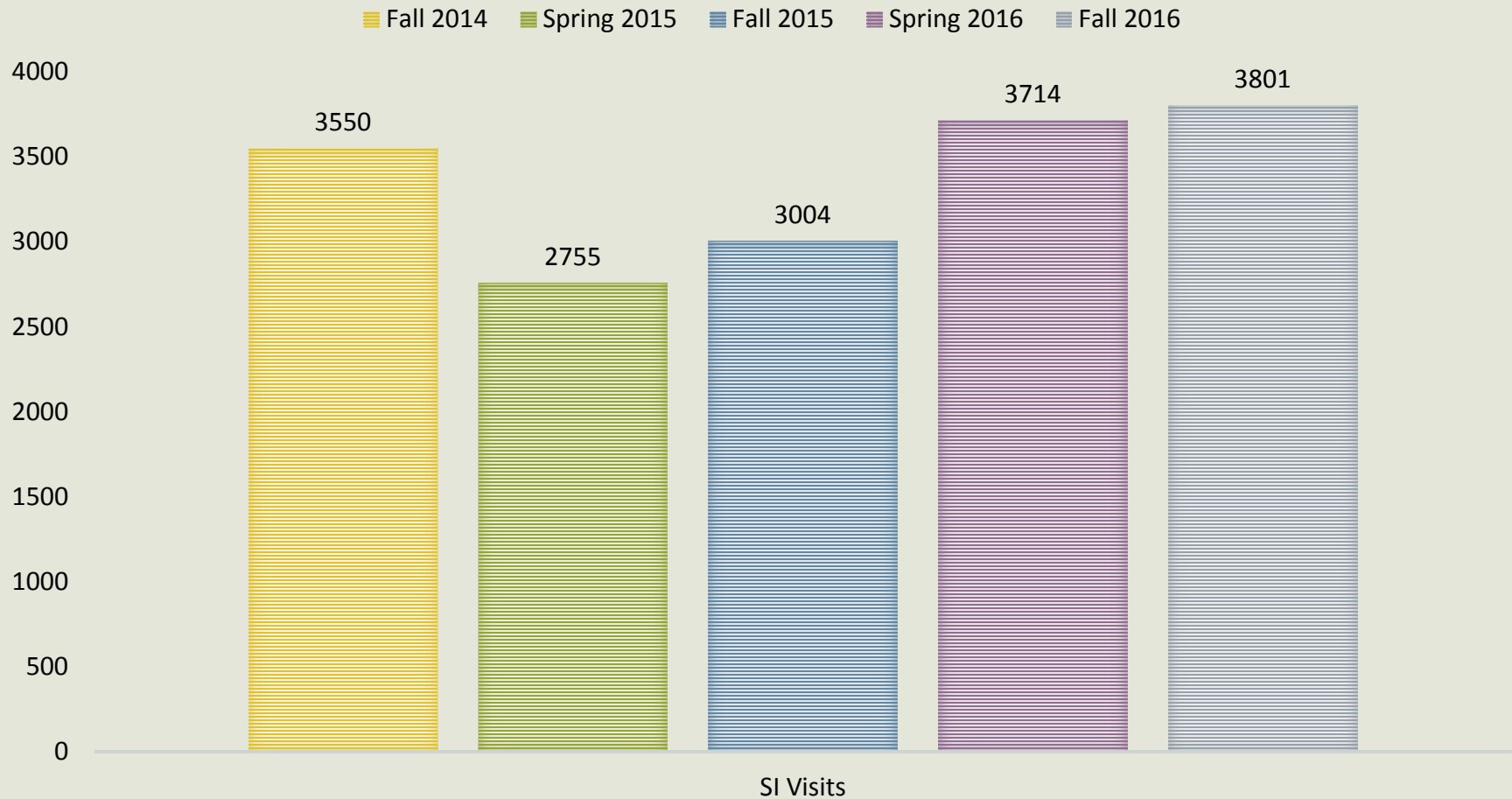
How does SI differ from traditional tutoring?

Supplemental Instruction Leader

- Focuses on content in a specific course section

- Typically works in a group setting

- Attends lectures with students

- Collaborates with course instructors regularly

- Holds sessions based upon students' availability

- Creates exam review activities based on class lectures and discussion with instructor

Traditional Tutor

- May focus on only the subject matter and not your specific section

- Usually one-on-one setting

- Does not attend lectures

- Is not expected to collaborate with instructors

- Tutoring sessions are by appointment or walk-in

- Does not create exam reviews

Embedded "Tutoring" Through SI:
The Non-Traditional Classroom

How Does it Work?

Extended, Embedded Classroom Formats

Team-Based Learning

- General Biology I/General Biology II

- General Chemistry I/General Chemistry II

- Students are placed into permanent groups at the beginning of the semester

- Students are expected to have read/watched lectures prior to class

- Readiness assurance process (RAP) in two sections:
    - iRAT: Individual assessment
    - tRAT: same assessment, completed as a team

- Based on RAP performance, lecturers will tailor a mini-lecture towards troublesome concepts

Problem-Based Learning

- College Algebra-Extended, Calculus I

- General Physics I/General Physics II

- Students work through exercises individually or in loosely formed, non-permanent groups

- Activities can be in-class assignments or homework
    - Some assignments can be started in class and finished/continued in SI sessions

- Utilized in traditional and flipped classrooms

# Role of SI Leader in Classroom

- Role predominantly dependent on instructor
  - Can be a bridge between the instructor and students
  - Can serve as model student in group activities
  - Can help with handouts and student questions
  - Can identify specific concepts that might need further explanation

- SI leaders in classroom:
  - Are knowledgeable of class activities, learning outcomes, and course materials
  - Aid in the understanding of course content during application activities by facilitating active discussion and participation
  - Take what they learn in class (especially difficult concepts, gaps in student foundations, etc.) to enhance SI sessions

The TBL Classroom

Calculus I: SI in the Classroom
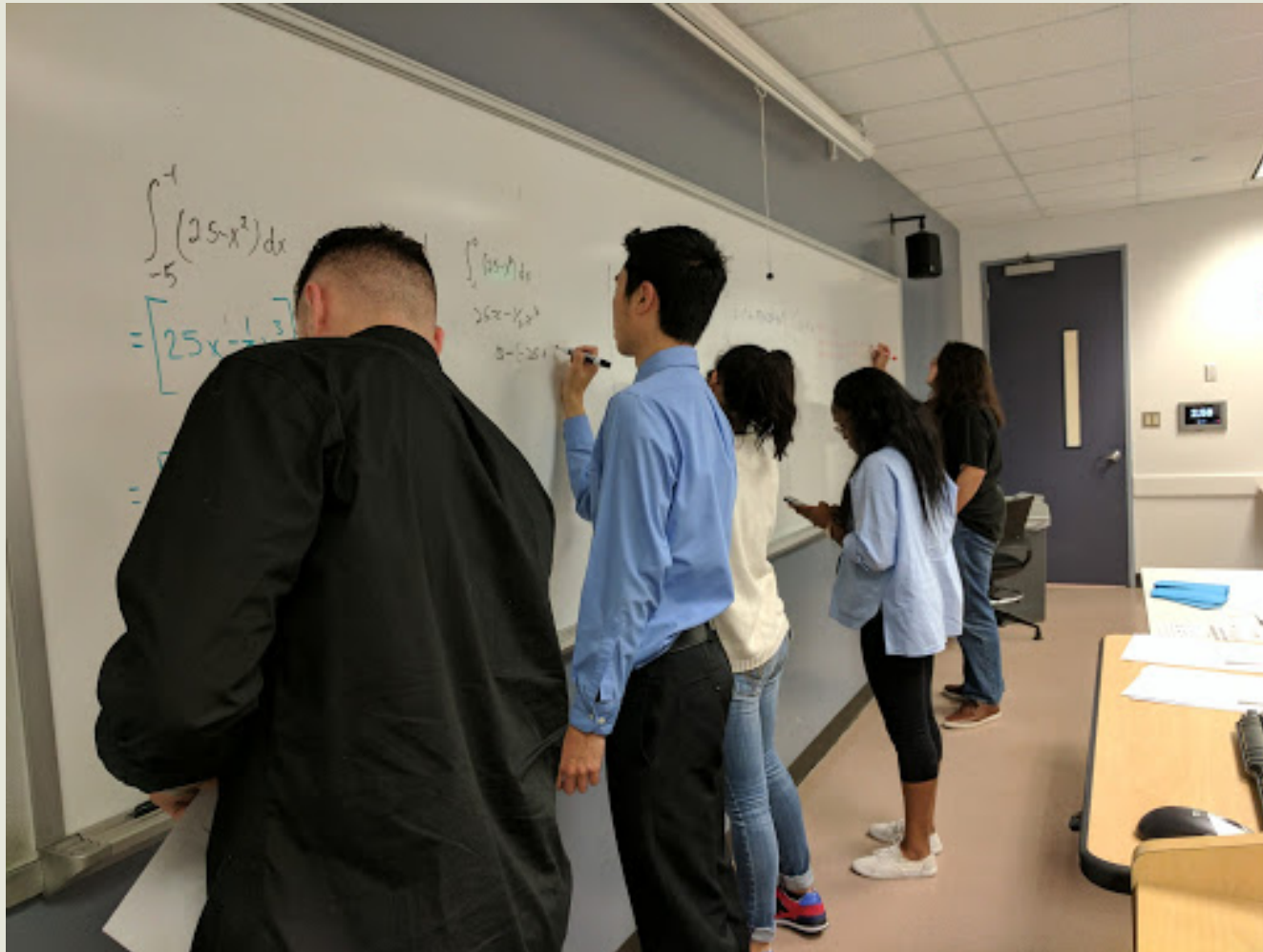
Methods

Data Collection

Assessment

Qualitative

- Faculty surveys
  - SI leader performance in class
  - Attendance/communication
  - Participation in class activities
- Student surveys
  - SI leader performance
  - Effectiveness of SI program
  - Session scheduling feedback
- SI leader surveys
  - Effectiveness of supervision and training
  - Positive and negative experiences
  - Advice for future SI leaders

Quantitative

- TutorTrac + Banner
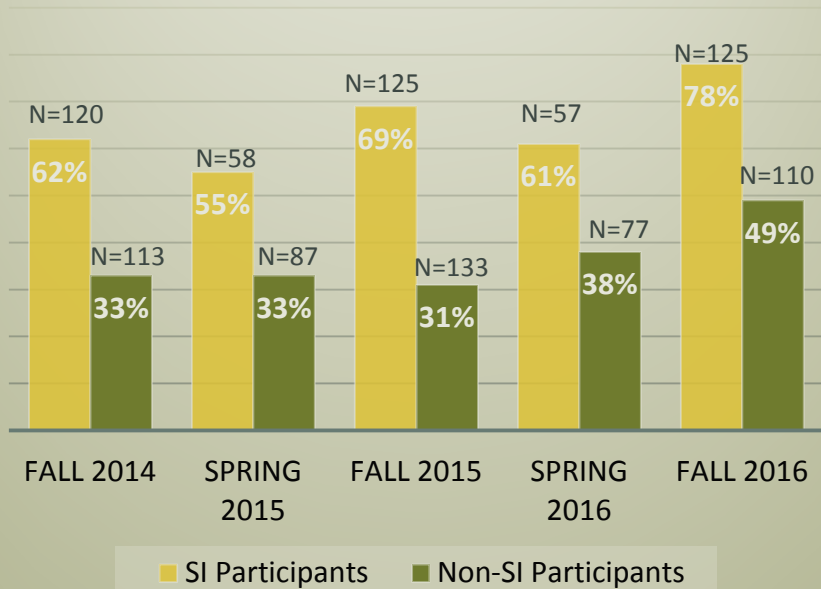- GPA comparison
- Pass Rate
- Attendance rate
- Repeat attendees
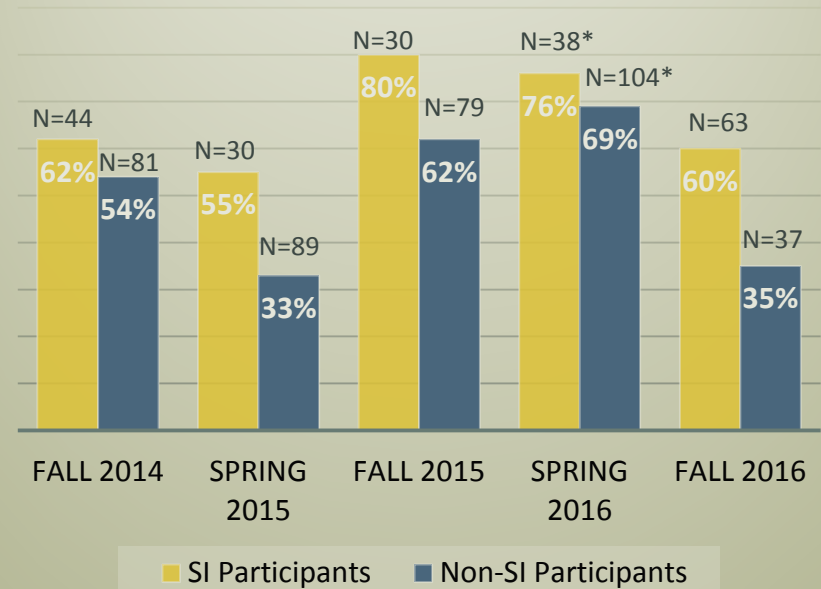
Impact on Students

Performance

Pass Rate Comparison for General Biology I & II

General Biology I A/B/C Rate

	FALL 2014	SPRING 2015	FALL 2015	SPRING 2016	FALL 2016
SI Participants	62% (N=120)	55% (N=58)	69% (N=125)	61% (N=57)	78% (N=125)
Non-SI Participants	33% (N=113)	33% (N=87)	31% (N=133)	38% (N=77)	49% (N=110)

- ■ SI Participants ■ Non-SI Participants

Overall ABC Rate: 38% (Fall 2011) → 65% (Fall 2016)

General Biology II A/B/C Rate

	FALL 2014	SPRING 2015	FALL 2015	SPRING 2016	FALL 2016
SI Participants	62% (N=44)	55% (N=30)	80% (N=30)	76% (N=38*)	60% (N=63)
Non-SI Participants	54% (N=81)	33% (N=89)	62% (N=79)	69% (N=104*)	35% (N=37)

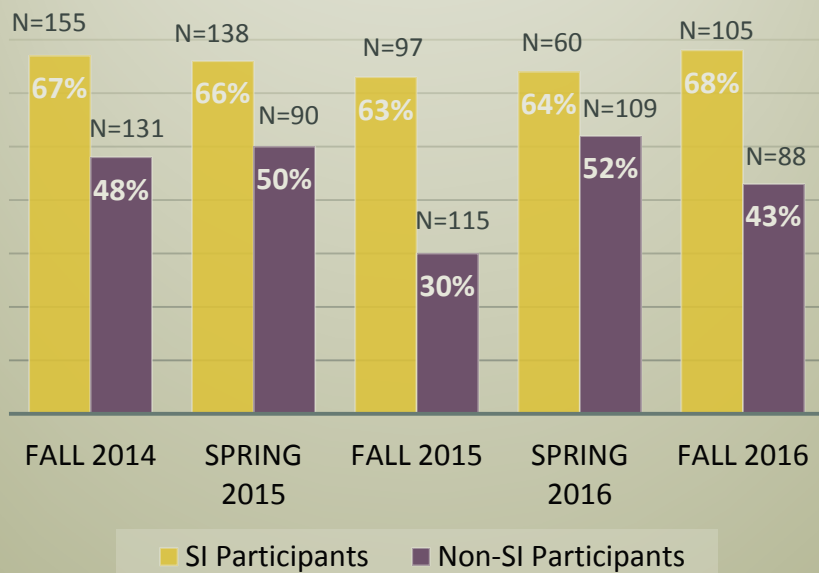- ■ SI Participants ■ Non-SI Participants

Overall ABC Rate: 43% (Spring 2012) → 71% (Spring 2016)

*Only one section out of three was staffed with an SI Leader.

Pass Rate Comparison for General Chemistry I & II
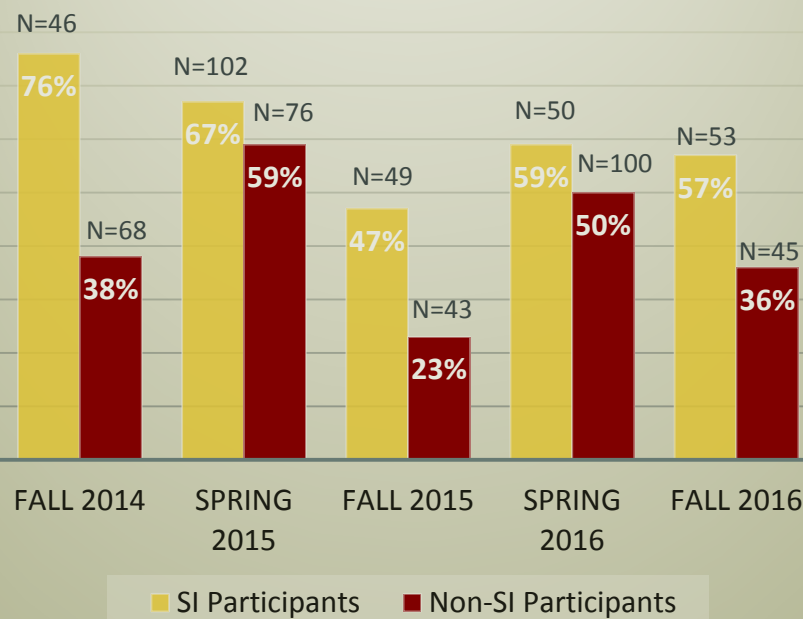

General Chemistry I A/B/C Rate

	FALL 2014	SPRING 2015	FALL 2015	SPRING 2016	FALL 2016
SI Participants	N=155, 67%	N=138, 66%	N=97, 63%	N=60, 64%	N=105, 68%
Non-SI Participants	N=131, 48%	N=90, 50%	N=115, 30%	N=109, 52%	N=88, 43%

Legend: ■ SI Participants ■ Non-SI Participants

General Chemistry II A/B/C Rate

	FALL 2014	SPRING 2015	FALL 2015	SPRING 2016	FALL 2016
SI Participants	N=46, 76%	N=102, 67%	N=49, 47%	N=50, 59%	N=53, 57%
Non-SI Participants	N=68, 38%	N=76, 59%	N=43, 23%	N=100, 50%	N=45, 36%

Legend: ■ SI Participants ■ Non-SI Participants

Overall ABC Rate: 44% (Fall 2011) → 57% (Fall 2016)

Overall ABC Rate: 37% (Spring 2012) → 53% (Spring 2016)

Percentage of Withdrawals

General Biology I	SI Participants	Non-SI Participants
Fall 2014	5.0%	15.9%
Spring 2015	12.1%	23.0%
Fall 2015	0.8%	11.3%
Spring 2016	7.0%	14.3%
Fall 2016	4.0%	13.6%

General Biology II	SI Participants	Non-SI Participants
Fall 2014	4.5%	6.2%
Spring 2015	0.0%	2.2%
Fall 2015	0.0%	6.3%
Spring 2016	2.6%	4.8%
Fall 2016	4.8%	27%

General Chemistry I	SI Participants	Non-SI Participants
Fall 2014	6.5%	7.6%
Spring 2015	7.2%	14.4%
Fall 2015	5.2%	17.4%
Spring 2016	5.0%	14.7%
Fall 2016	6.7%	14.6%

General Chemistry II	SI Participants	Non-SI Participants
Fall 2014	4.3%	22.1%
Spring 2015	6.9%	10.5%
Fall 2015	6.1%	25.6%
Spring 2016	10.0%	16.0%
Fall 2016	13.2%	28.9%

Calculated as # withdrawals / number in cohort

Pass Rate Comparison for MATH 1301/130E and Calculus I

College Algebra A/B/C Rate

- FALL 2014: SI Participants N=135, 78%; Non-SI Participants N=301, 58%
- SPRING 2015: SI Participants N=39, 59%; Non-SI Participants N=171, 39%
- FALL 2015*: SI Participants N=31, 84%; Non-SI Participants N=72, 64%
- SPRING 2016: SI Participants N=9, 89%; Non-SI Participants N=15, 80%
- FALL 2016: SI Participants N=42, 73%; Non-SI Participants N=77, 55%

Legend: ■ SI Participants ■ Non-SI Participants
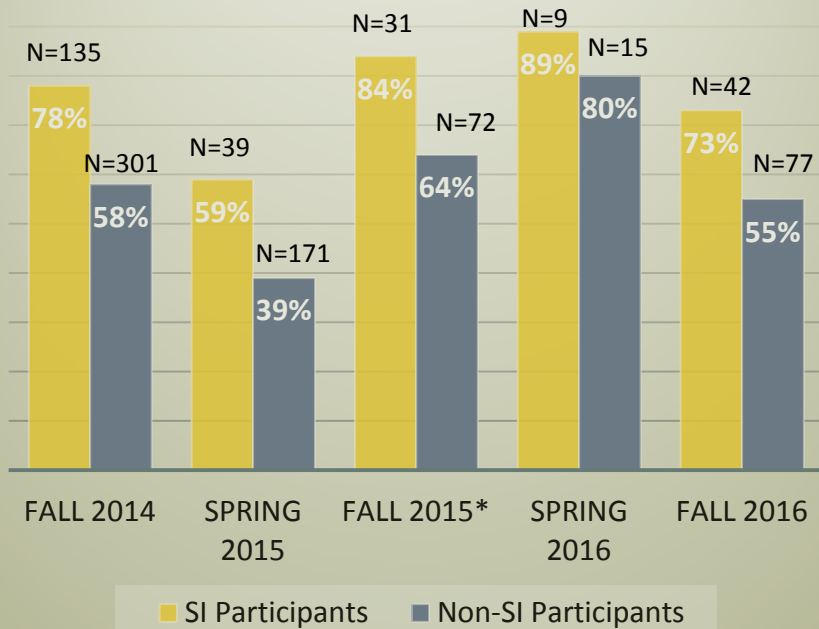
Overall ABC Rate: 42% (Fall 2006) → 75% (Fall 2016)

Calculus I A/B/C Rate

- FALL 2014: SI Participants N=49, 61%; Non-SI Participants N=50, 38%
- SPRING 2015: SI Participants N=60, 46%; Non-SI Participants N=62, 29%
- FALL 2015: SI Participants N=54, 55%; Non-SI Participants N=91, 32%
- SPRING 2016: SI Participants N=62, 51%; Non-SI Participants N=53, 33%
- FALL 2016*: SI Participants N=44, 89%; Non-SI Participants N=58, 49%

Legend: ■ SI Participants ■ Non-SI Participants
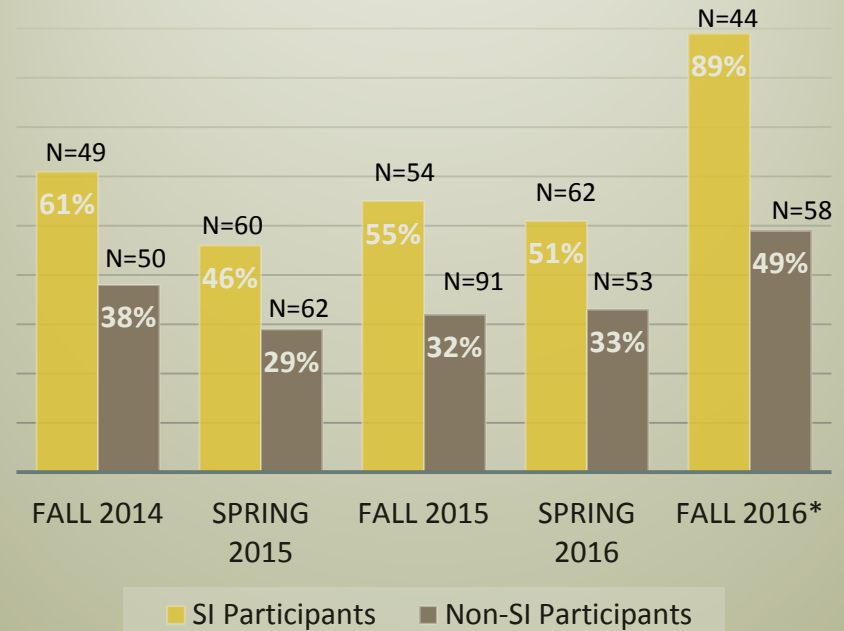
Overall ABC Rate: 37% (Fall 2010) → 70% (Fall 2016)

*Semester embedded tutoring began

Percentage of Withdrawals

College Algebra	SI Participants	Non-SI Participants
Fall 2014	2.7%	6.6%
Spring 2015	2.6%	11.1%
Fall 2015	0%	1.4%
Spring 2016	0%	6.7%
Fall 2016	2.4%	6.5%

Calculus I	SI Participants	Non-SI Participants
Fall 2014	4.1%	6.0%
Spring 2015	3.3%	16.1%
Fall 2015	3.7%	17.6%
Spring 2016	1.6%	17.5%
Fall 2016	2.3%	6.9%

Calculated as # withdrawals / number in cohort

Impact on Students

Engagement

Attendance to SI Sessions

Percent Attended

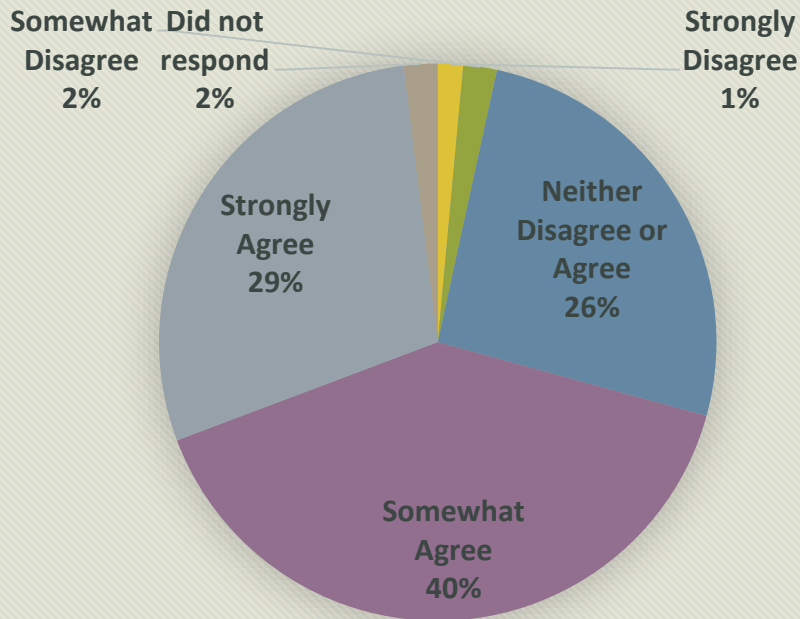|	FALL 2014	SPRING 2015	FALL 2015	SPRING 2016	FALL 2016
Non-TBL Attendance	34%	31%	34%	36%	35%
BIOL Attendance	46%	33%	42%	34%	56%
CHEM Attendance	50%	59%	48%	47%	54%
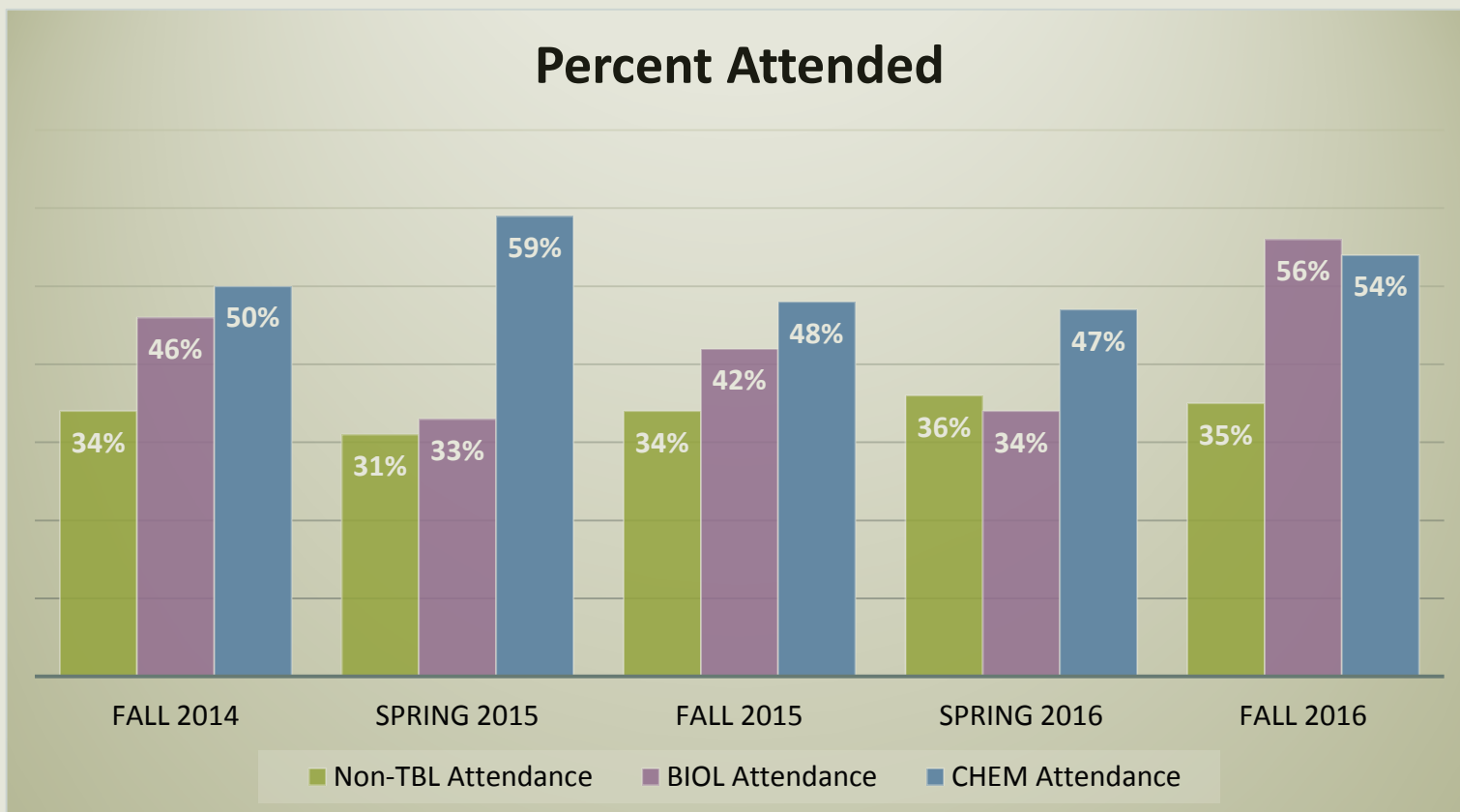
Attendance to SI Sessions
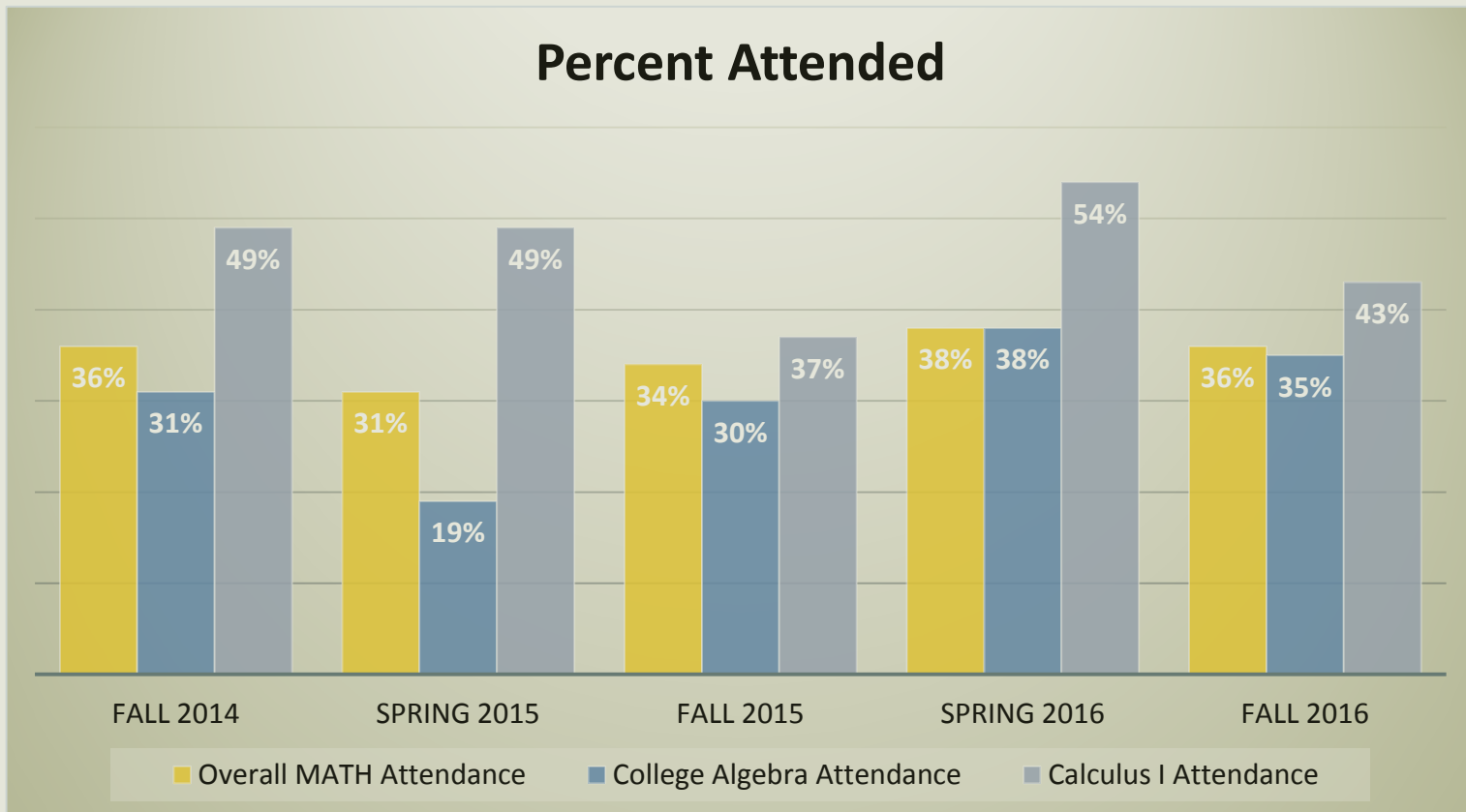
End of Semester Survey Results: General Biology I

Statement: I believe the SI program will positively contribute to my overall grade for this class.
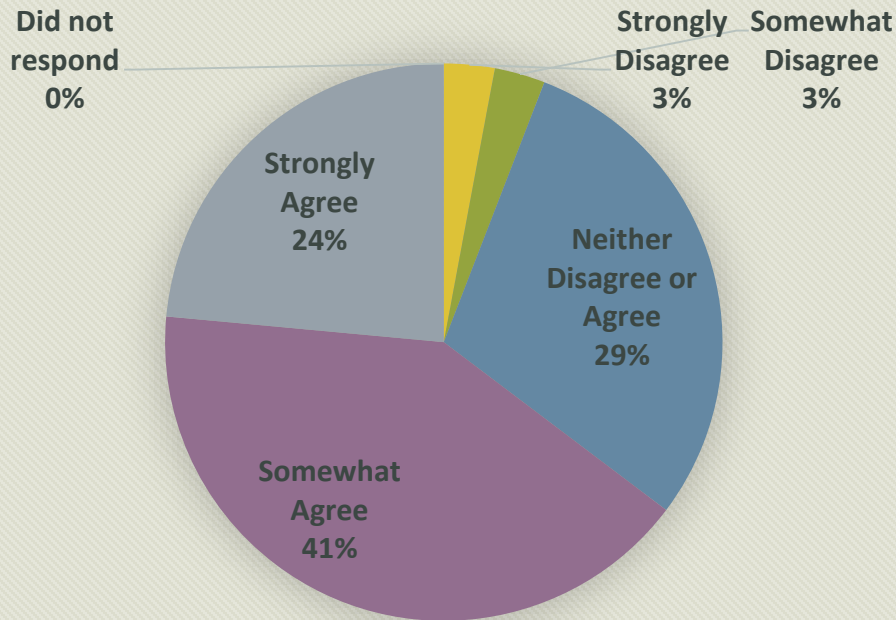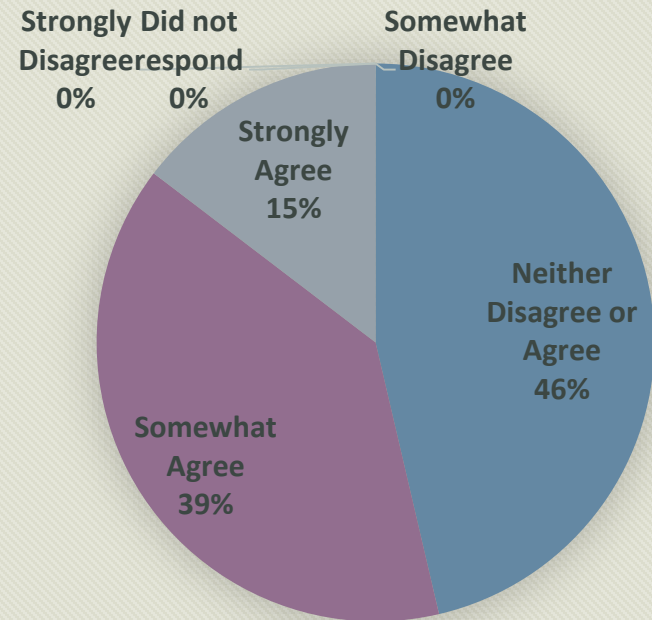
SI Participants

- Somewhat Disagree 2%
- Did not respond 2%
- Strongly Disagree 1%
- Strongly Agree 29%
- Neither Disagree or Agree 26%
- Somewhat Agree 40%

N=132

Non-SI Participants

- Did not respond 2%
- Strongly Somewhat Disagree 2%
- Disagree 2%
- Strongly Agree 17%
- Neither Disagree or Agree 36%
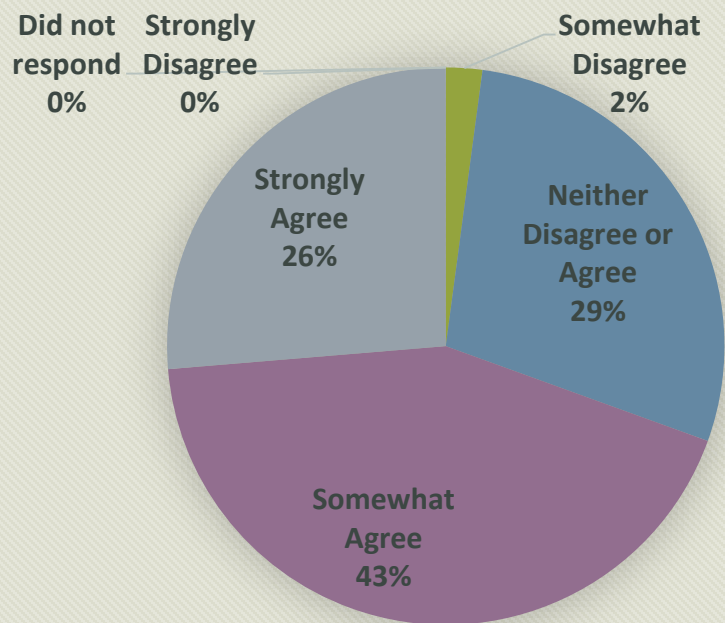- Somewhat Agree 41%

N=53
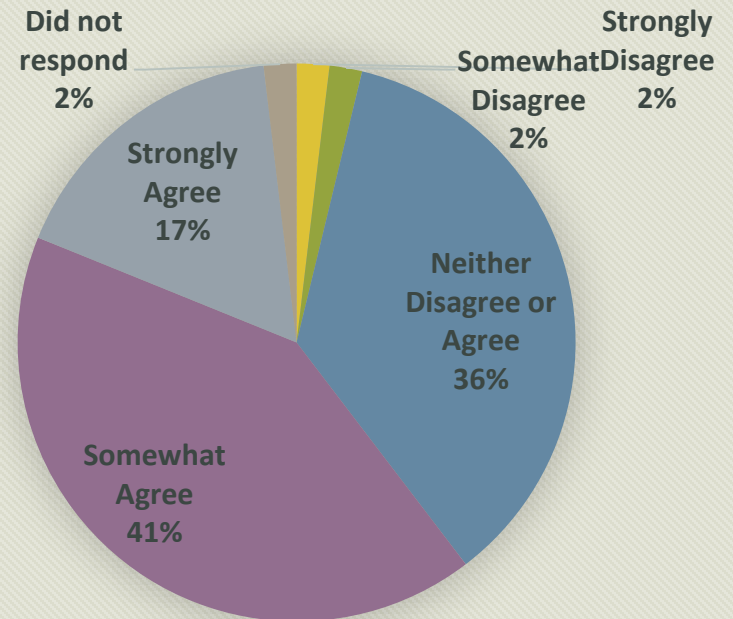
*Survey results are from Fall 2015

End of Semester Survey Results: General Biology II

Statement: I believe the SI program will positively contribute to my overall grade for this class.

SI Participants

Did not respond 0%
Strongly Disagree 3%
Somewhat Disagree 3%
Strongly Agree 24%
Neither Disagree or Agree 29%
Somewhat Agree 41%

N=34

Non-SI Participants

Strongly Disagree 0%
Did not respond 0%
Somewhat Disagree 0%
Strongly Agree 15%
Neither Disagree or Agree 46%
Somewhat Agree 39%

N=53

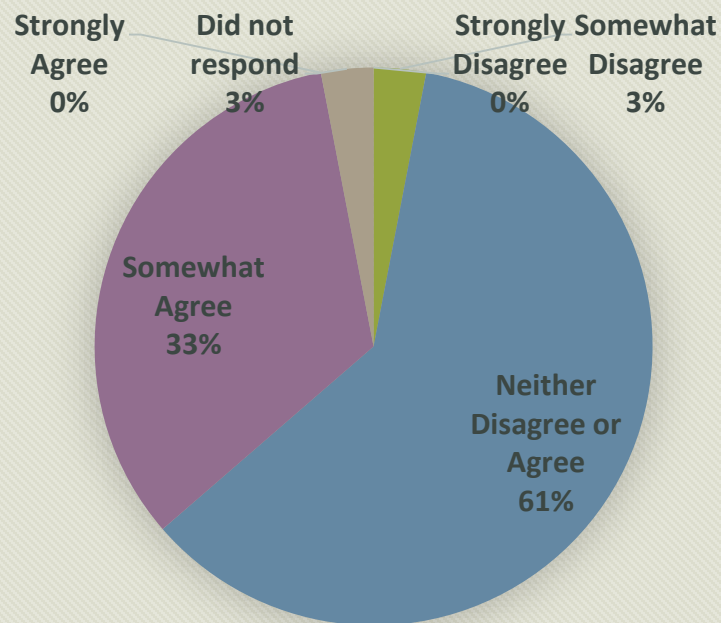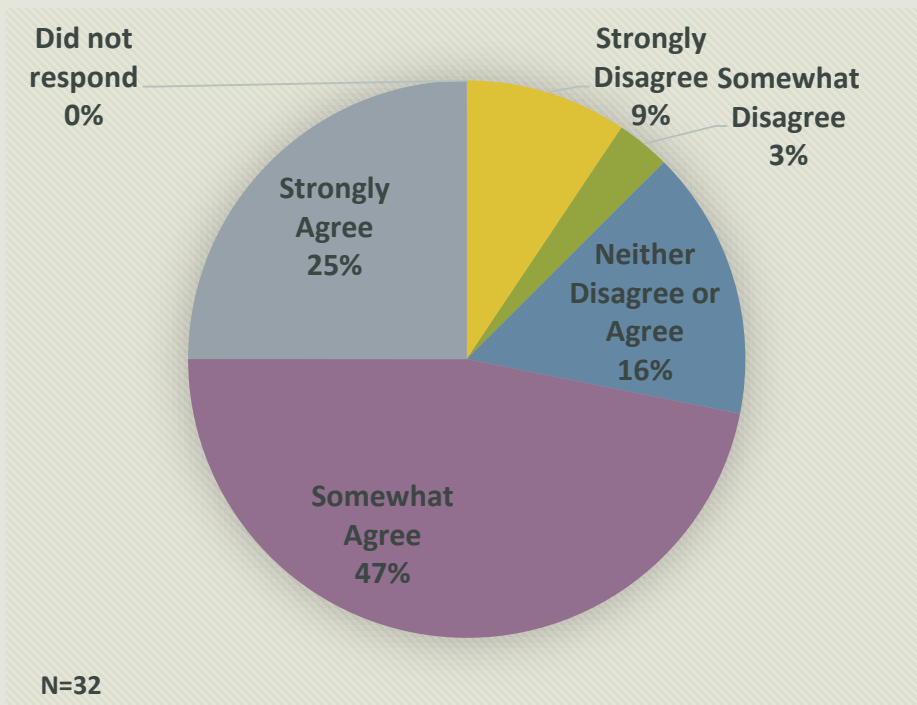*Survey results are from Fall 2015

End of Semester Survey Results: General Chemistry I

Statement: I believe the SI program will positively contribute to my overall grade for this class.

SI Participants

Did not respond 0%
Strongly Disagree 0%
Somewhat Disagree 2%
Strongly Agree 26%
Neither Disagree or Agree 29%
Somewhat Agree 43%

N=95

Non-SI Participants

Strongly Agree 0%
Did not respond 3%
Strongly Disagree 0%
Somewhat Disagree 3%
Somewhat Agree 33%
Neither Disagree or Agree 61%
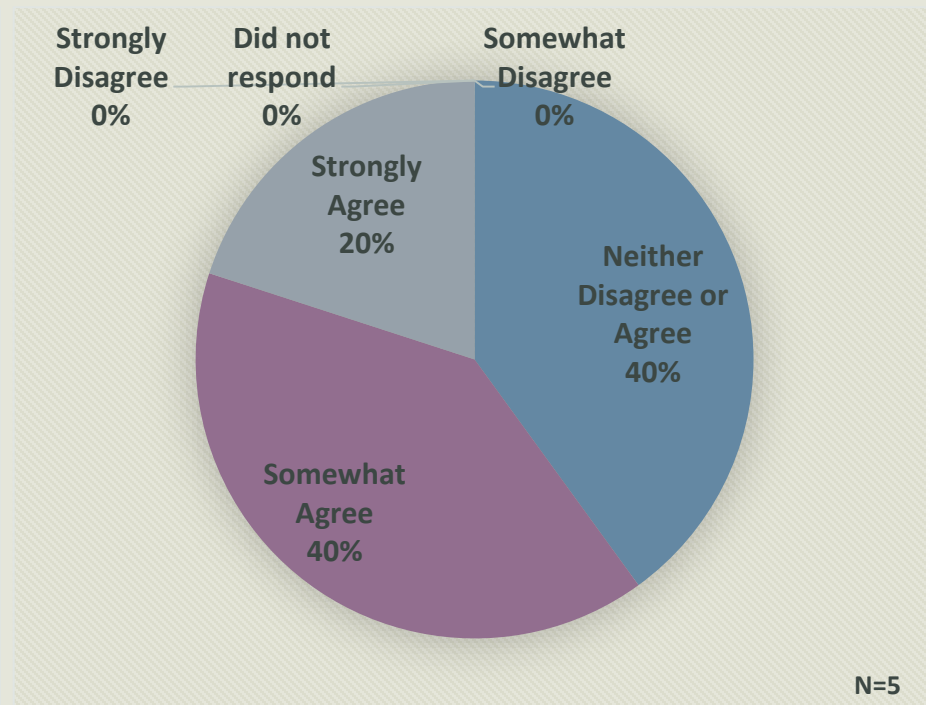
N=33

*Survey results are from Fall 2015

End of Semester Survey Results: General Chemistry II

Statement: I believe the SI program will positively contribute to my overall grade for this class.
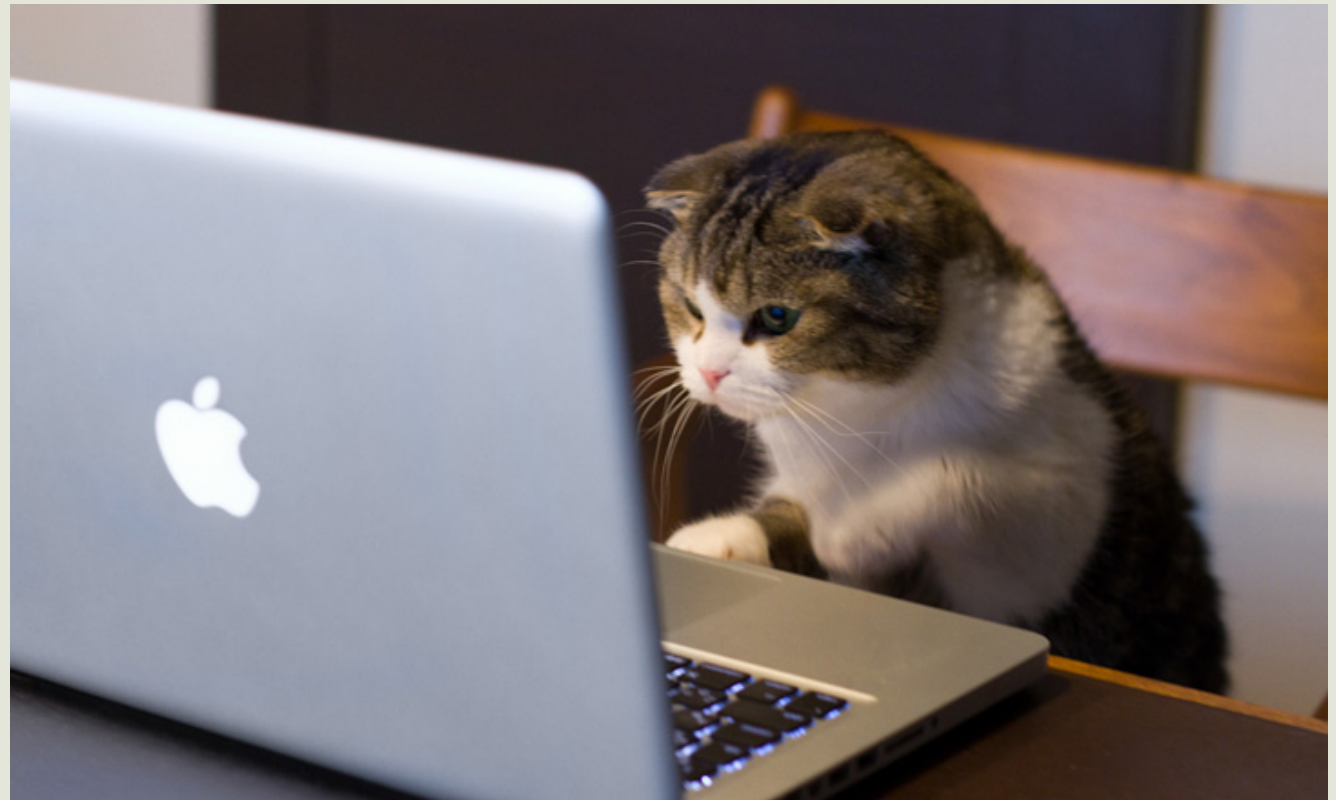
SI Participants

- Did not respond 0%
- Strongly Disagree 9%
- Somewhat Disagree 3%
- Neither Disagree or Agree 16%
- Somewhat Agree 47%
- Strongly Agree 25%

N=32

Non-SI Participants

- Strongly Disagree 0%
- Did not respond 0%
- Somewhat Disagree 0%
- Neither Disagree or Agree 40%
- Somewhat Agree 40%
- Strongly Agree 20%

N=5

*Survey results are from Fall 2015

Student Retention & "Risk" Assessment

Results coming soon!

What We Learned

- Non-Traditional Classroom Model + SI
  - Extra 30 minutes = perfect for scheduling
  - Brings together Learning Assistance, Faculty Instruction, and Institutional Research
  - Fear is a powerful motivator
  - Bring the help *to* the student
  - Non-traditional classroom → more interaction between SI and student → more time for marketing, encouragement, rapport → peer-driven engagement → higher attendance to SI sessions → better performance (even for under-performers!)

- Future Goals
  - Change 5-item Likert scale to 4-item (remove neutral option)
  - Maintain faculty buy-in
  - Build more faculty "liaisons"
  - Maintain (and create more) opportunities for student research and other high-impact practices

Impact on SI Leaders

Spring 2017 SI Leaders

Thank you!

Question time!