Supplemental Instruction

MISSION STATEMENT
Purdue University’s Supplemental Instruction (SI) Program develops academic support communities of higher level thinkers and self-empowered learners. This self-selecting, course-specific, peer-led program seeks to promote active, collaborative learning involving critical thinking and transferable study skills. Its efforts are aimed at improving the retention rate of students enrolled in the SI-linked courses and helping students pass these courses at a higher rate.

VISION STATEMENT
Supplemental Instruction (SI) at Purdue will help students enrolled in historically challenging courses succeed at higher rates and continue their education in a timely manner. SI at Purdue will become an exemplary, effective academic assistance model through which students will engage in success-oriented behaviors, and by which other institutions can benchmark.

PROGRAM GOALS
Supplemental Instruction will:
1. Focus on large courses with high D, F, and W rates to link with the SI Program
2. Help students earn a higher course grade than their peers who did not attend the study sessions, in particular, those students who attend the study sessions weekly
3. Reduce the number of D, F, and W grades for the students attending SI study sessions
4. Improve retention rates for students attending the SI study sessions by providing an active, engaging, inclusive learning environment that promotes critical thinking and shared, transferrable study strategies
5. Reinforce course material and instill leadership abilities and potential among the student leaders
6. Build strong relationships with SI-linked faculty helping them to appreciate the benefits of SI as well as the struggle students may have with the course material

LEARNING OUTCOMES  (* focus for this academic year)
As a result of participating in SI, students will:
1. Increase their understanding of course concepts and be able to apply them to different sets of problems and to understand how concepts from different disciplines connect (Science, Technology, and Math (Integrative Knowledge))
2. Develop critical thinking skills that mature beyond memorization in a way that enables them to evaluate, analyze and demonstrate evidence of their learning (Critical Thinking and Quantitative Reasoning)
3. Acquire transferrable study skill behavior which will allow students to become more confident in their approach to mastering future difficult material (Self-Efficacy and Self-Advocacy)*

As a result of participating in SI, student leaders will:
1. Develop creative thinking skills as they design lesson plans around various learning styles (Creative Thinking)
2. Enhance critical thinking skills as they set and assess learning objectives for their study sessions based on Bloom’s Taxonomy of higher level thinking (Critical Thinking)
3. Develop professionally by improving their oral and written communication skills as they attempt to explain concepts and organize activities (Oral Communication)
4. Build their leadership skills as they facilitate group participation and collaboration (Leadership and Teamwork)*

**ASSESSMENT PLAN**
As an effort to improve SI each year and to ensure that we are making progress on our goals and desired learning outcomes, we conduct a comprehensive assessment plan where we gather data and use it to inform future decisions. We engage in the following assessment efforts:
- Report comparisons of course grades for the SI attendees according to the number of times they attended the study sessions (0, 1 – 2, 3 – 4, 5 – 7, and 8 or more)
- Report comparisons of D, F, and W grades for those who attended SI study sessions versus those who did not
- Examine students’ perception of understanding of course material having attended SI study sessions through the end-of-semester survey
- Examine students’ perception of their acquisition of transferrable learning strategies through the end-of-semester survey
- Examine the professional growth of SI leaders through portfolio reflections, session plans, mid-semester conversations, observations, and team meetings*

**CONTRIBUTIONS TO STUDENT SUCCESS**
SI contributes to the institutional goal of enhancing retention rates, GPA success, and satisfaction levels of Purdue students in the following ways:
1. Supplemental Instruction (SI) contributes to student retention, graduation, and well-being by:
   a. Offering peer-led, weekly academic study sessions for students enrolled in challenging courses, allowing them possibility of graduating at a faster pace
   b. Providing an environment where students learn to ask thoughtful, course-specific, conceptual questions of themselves and each other, and become more invested in their own learning
   c. Increasing students’ confidence in attacking tough course material by being aware of how they study and how those strategies can apply to other courses
   d. Enhancing leadership skills, job opportunities, and professor interaction for students
2. Supplemental Instruction (SI) works with other campus partners in the following ways:
   a. Encouraging faculty to:
      i. Consider linking their course with the SI program
      ii. Understand the function and best practices of the SI program
      iii. Help with the interviewing and selection of student leaders
      iv. Participate in the faculty social settings before and following the semester
      v. Provide diversity and study strategy workshops for the two-day pre-semester SI leader training
      vi. Collaborate with SI for innovative ways to reach students such as the math hybrid model for the IMPACT section of MA 161, and the dual duty of the SI leader by having them hold their office hours in the ME 200 help room
   b. Communicating with academic advisors for suggestions for SI course links and for promoting the study sessions
   c. Working with Science Bound and Purdue Promise to support and monitor SI study session attendance for those students
   d. Sharing space with the Co-Rec facility and several residence halls for weekly sessions
3. Supplemental Instruction also contributes to the Gallup-Purdue Index\(^1\) findings by:
   a. Showing or demonstrating they care about students as individuals
      i. Creating a learning environment that focuses on inclusivity and the importance of individual contributions to the group (students)
      ii. Providing emotional support to students in tougher courses by increasing their confidence in navigating through and mastering difficult material by means of effective study strategies (students)
      iii. Encouraging SI leaders to form an academically interactive relationship with professors on a weekly basis (leaders)
   b. Helping students become excited about learning
      i. Providing a relaxed atmosphere with interactive activities where students can spark their interest in learning and where confidence builds when demonstrating to their peers (leaders and students)
      ii. Providing a learning environment in which creative activities make learning fun (leaders)
   c. Encouraging students to pursue their dreams
      i. Enabling students to stay on schedule with their academic goals by not having to retake courses and thereby graduate at a faster rate (students)
   d. Guiding students to apply their classroom learning to jobs, internships, or “real world” experiences
      i. Giving SI leaders an employment opportunity to expand and revisit their knowledge about a particular subject (leaders)
      ii. Supervising and mentoring them as student leaders, thereby preparing them for future job and internship opportunities (leaders)
   e. Helping students get involved in extracurricular activities and organizations
      i. Providing examples of well-rounded students with good time-management skills by way of the SI leaders (students)
      ii. Sharing campus resources and activities with students (students)
      iii. Forming discipline-specific teams led by SI leaders who provide an off-campus, relaxed atmosphere for their team leader meetings (leaders)
   f. Creating significant projects for students to work on that may take more than a semester to complete
      i. Implementing student leader, academic-year portfolios exhibiting best practices and self-reflections (leaders)

**NOTABLE CHANGES FROM 2013-2014**

- Departmental cost-sharing for thirteen leaders from four areas: Management (3), Computer Science (5), Math (3), and Engineering (2)
- Collaborating with the Math Department for a hybrid SI Leader/Tutor model for the Calculus I IMPACT course
- Receiving an endowment from John and Marcy Towns (Ph. D. ’91 and Purdue Ph. D. ’94), with a matching amount from The Lilly Foundation, for supplementing non-foundational high risk courses and adding leaders to existing courses with burgeoning attendance
- Earning the International Outstanding Program of the Year Award for 2014
- Nominating and receiving an award for a student leader for Outstanding Leader of the Year 2014
- Integrating student portfolios into the SI leader roles

• Having the embedded learning outcome of creative thinking be accepted as fulfilling a core curriculum competency for leaders
• Hiring an Assistant Director of SI and Academic Enhancement

OUR DATA

Fall 2013

<table>
<thead>
<tr>
<th>Grade</th>
<th>Fall 2013 Aggregate</th>
<th>Number of Sessions Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1-2</td>
</tr>
<tr>
<td>A</td>
<td>26%</td>
<td>*31%</td>
</tr>
<tr>
<td>B or better</td>
<td>55%</td>
<td>*65%</td>
</tr>
<tr>
<td>C or better</td>
<td>81%</td>
<td>*89%</td>
</tr>
<tr>
<td>DFW</td>
<td>19%</td>
<td>*11%</td>
</tr>
<tr>
<td>N=</td>
<td>7527</td>
<td>1548</td>
</tr>
</tbody>
</table>

* significant at the point of p<.001 when compared to 0 attendance

• Of the students who attended 8 or more times, 95% earned a C or better; 76% earned a B or better; and 46% earned an A
• The DFW rate had a difference of 14 percentage points between those who attended regularly and those who did not attend

Spring 2014

<table>
<thead>
<tr>
<th>Grade</th>
<th>Spring 2014 Aggregate</th>
<th>Number of Sessions Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1-2</td>
</tr>
<tr>
<td>A</td>
<td>24%</td>
<td>*20%</td>
</tr>
<tr>
<td>B or better</td>
<td>54%</td>
<td>53%</td>
</tr>
<tr>
<td>C or better</td>
<td>80%</td>
<td>*85%</td>
</tr>
<tr>
<td>DFW</td>
<td>20%</td>
<td>*15%</td>
</tr>
<tr>
<td>N=</td>
<td>9186</td>
<td>1016</td>
</tr>
</tbody>
</table>

* significant at the point of p<.001 when compared to 0 attendance

• Of the students who attended 8 or more times, 94% earned a C or better; 71% earned a B or better; and 37 % earned an A
• The DFW rate had a difference of 14 percentage points between those who attended 8 or more times and those who did not attend
Retention Data:
- In the first academic year that SI was implemented at Purdue, 2011-12, the first year retention rate for SI participants was five percentage points higher than that of the university. Additionally, the second year retention rate for SI participants was six percentage points higher. *Both were significant at the point of .001.
- For academic year 2012-13, the first year retention rate was three percentage points higher for SI participants than that of the university. *This was also significant at the point of .001.

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Cohort</th>
<th>One Year Retention Rate</th>
<th>Two Year Retention Rate</th>
<th>Three Year Retention Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-12</td>
<td>SI</td>
<td>95.15%</td>
<td>90.80%</td>
<td>87.56%</td>
</tr>
<tr>
<td></td>
<td>Non SI</td>
<td>89.77%</td>
<td>83.21%</td>
<td>79.79%</td>
</tr>
<tr>
<td>2012-13</td>
<td>SI</td>
<td>94.38%</td>
<td>90.80%</td>
<td>#DIV/0!</td>
</tr>
<tr>
<td></td>
<td>Non SI</td>
<td>89.89%</td>
<td>84.66%</td>
<td>#DIV/0!</td>
</tr>
<tr>
<td>2013-14</td>
<td>SI</td>
<td>95.11%</td>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
</tr>
<tr>
<td></td>
<td>Non SI</td>
<td>91.64%</td>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
</tr>
</tbody>
</table>

History of Courses, Leaders, Visits, Unique Students: (number of students coming is cyclical from fall to fall and spring to spring semesters)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
<th>Student Leaders</th>
<th>Number of Visits</th>
<th>Number of Unique Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2011</td>
<td>MA 153,154,159,161,162; BION 203; CS 159; MGMT 200; STAT 301; COM 318; PHYS 172</td>
<td>22</td>
<td>2,717</td>
<td>967</td>
</tr>
<tr>
<td>Spring 2012</td>
<td>MA 153, 154, 161, 162; BION 204, 111; CS 159; MGMT 200; STAT 301, 113; COM 318; PHYS 152; CHM 115</td>
<td>21</td>
<td>4,522</td>
<td>1033</td>
</tr>
<tr>
<td>Fall 2012</td>
<td>MA 153, 161, 162; BION 203, 110; CHM 115, 116; MGMT 200; STAT 113; PHYS 172; CS 159</td>
<td>22</td>
<td>5,996</td>
<td>1637</td>
</tr>
<tr>
<td>Spring 2013</td>
<td>MA 153, 154, 161, 162; BION 111, 204; CS 158/9; MGMT 200; PHYS 172; CHM 112, 115,116</td>
<td>22</td>
<td>5,659</td>
<td>1115</td>
</tr>
<tr>
<td>Fall 2013</td>
<td>MA153, 158, 161, 162; BION 110, 203; CS 158/159; MGMT 200, 201; PHYS 172; CHM 111, 115, 116, 129; ME 200</td>
<td>23</td>
<td>9,111</td>
<td>2,458</td>
</tr>
<tr>
<td>Spring 2014</td>
<td>MA 153, 158, 161, 162; BION 110, 111, 204; CS 158/159; MGMT 200, 201; PHYS 172; CHM 112, 115, 116; ME 200</td>
<td>24</td>
<td>7,287</td>
<td>1,533</td>
</tr>
<tr>
<td>Fall 2014</td>
<td>MA 153, 158, 161, 16110, 162; BION 110, 203; CS 158/159, 180, 240; MGMT 200, 201; PHYS 172, 241; CHM 111, 115, 116, 129; ME 200</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
End-of-Semester Survey Results from Spring 2014:
Students were asked about the grade they expected to get and the actual grade they received.²

<table>
<thead>
<tr>
<th>Expected vs. Received Grades</th>
<th>Mean</th>
<th>Median</th>
<th>St. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>“What grade did you expect to get in this course?”</td>
<td>3.27</td>
<td>3.00</td>
<td>0.72</td>
</tr>
<tr>
<td>“What grade are you actually getting?”</td>
<td>3.05</td>
<td>3.00</td>
<td>0.86</td>
</tr>
<tr>
<td>Expected minus Actual difference</td>
<td>0.25</td>
<td>0.00</td>
<td>0.70</td>
</tr>
</tbody>
</table>

On average, students expected to get about a B+ (3.3) and received a B (3.0). However, the standard deviations on this figure vary ¾ of a letter grade (0.72-0.86) and there are several extreme outliers (ex: students who expected an A and received a D).

Students were then asked “If I had not come to SI, I think my grade would have been;” and had a scale of five options ranging from “Much better” to “Much worse.” A majority of students (89.1%) responded their grade would have been worse without SI.

<table>
<thead>
<tr>
<th>“If I had not come to SI, I think my grade would have been:”</th>
<th># Responses</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much worse</td>
<td>60</td>
<td>30.9%</td>
</tr>
<tr>
<td>Somewhat worse</td>
<td>113</td>
<td>58.2%</td>
</tr>
<tr>
<td>About the same</td>
<td>14</td>
<td>7.2%</td>
</tr>
<tr>
<td>Somewhat better</td>
<td>3</td>
<td>1.5%</td>
</tr>
<tr>
<td>Much better</td>
<td>2</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

The final question was an open-ended response that prompted “Has SI helped you improve as a student? If so, how?” 93.3% responded positively, 6.2% responded neutrally, and 0.5% (one student) responded negatively. The common themes that emerged from the responses are:

- Improvement in understanding/comprehension
- Increased confidence in the material
- Knowing what to focus on
- Easier to retain knowledge
- Having the practice was helpful
- Improved study skills
- Appreciation of group work and cooperation
- A safe place to ask questions
- Improved time management
- Two students referred to SI as a “life saver”

Student Leader Portfolio Assessment Results:
Student leaders submit five pro-tips for session management, five of their best activities, two of their best lesson plans, and two final reflections for a portfolio. Professors are given the opportunity to review the compilation and make comments at the end of the academic year. A rubric based on the core curriculum competencies and embedded learning outcomes, was created to measure the leaders’ development of creative thinking skills. The evaluation of the portfolio entries can measure a leader as proficient, emerging, developing, or lacking according to the criteria of the rubric. After the first round of evaluations in which two supervisors individually evaluated the same seven portfolios as well as two observation reports and two randomly selected lesson plans, 86% of the leaders were scored as emerging or proficient, with over half of them being proficient/outstanding. This assessment will continue each semester. The portfolios not only provide a creative thinking measurement, but they also

² Letter responses were converted to a GPA scale (A=4.0, A-=3.7, etc.)
provide a resource and benchmark for new leaders as they try to be more innovative with varied activities when preparing their lesson plans.

**OUR STORY**
In Fall 2010 Provost Tim Sands directed Student Access, Transition and Success Programs (SATS), now Student Success at Purdue, to establish Supplemental Instruction (a proven, evidence-based form of peer-led academic assistance) as a student success initiative at Purdue University. The program was implemented in the fall of 2011. Fall 2014 is the 6th semester for SI.

Thirty student leaders are currently hired to supplement twenty different courses for fall 2014. Faculty members of SI-linked courses are becoming more involved in the selection of leaders for their courses by participating in the interviewing process, and by allowing the student leader more visibility and advertising in the lectures. A noticeable correlation between professor endorsement and involvement, and higher attendance at the study sessions, continues to exist.

The program was awarded Outstanding Program of the Year, 2014, at the International SI Conference at the Chicago Marriott on Friday, May 23, 2014. The letter of notification said, “This recognition acknowledges the extraordinary contribution that you and your staff have made to the international SI community due to outstanding success that has been achieved with your program.” Evaluation criteria for this award included evidence of success by recognition from students, program staff, faculty, and campus administrators; evidence of successful program outcomes in student learning, increased graduation rates, and reduced attrition; and evidence of successful marketing of the program.

A student leader, Chelsea Hunter (BIOL 110-Fundamentals of Biology I) was awarded Outstanding SI Leader of the Year. The letter of notification said, “This recognition acknowledges the extraordinary commitment Chelsea has made to SI and positive success she has created in your program.” Chelsea and two other former SI leaders, Ronit Patnaik and David Manring, have all been accepted into the Indiana University School of Medicine.

One of our former math SI leaders, Sara Daniel, a senior math education major, is an Undergraduate Teaching Assistant for the Purdue Math Department, teaching Algebra and Trig I this fall. One of our former leaders for the School of Management will be helping to mentor the new leaders this fall.

The implementation of student leader portfolios in which the leaders showcase their best practices has become an assessment tool for meeting the creative thinking embedded learning outcome. Leaders who meet the requirements for this assessment can satisfy the creative thinking learning competency for graduation. The University Core Curriculum Committee approved the use of this measurement in April, 2014. The portfolio evaluation results, which used a rubric to determine the level of creative thought, have been presented at the Ohio State Assessment Conference and will be shared at other conferences as well.

**Presentations at Conferences:**
- College Reading and Learning Association, CRLA Conference, Boston, November 2013: “Selling the SI Culture”
- First Year Experience, FYE Conference, San Diego, February 2014: “Performance Driven Success”
- International SI Conference, Chicago, May 2014:
  - “Professor Involvement: Utilizing Faculty Support for Program Strength”
    - Dr. David Bos, Biology Professor, helped with this presentation
  - “Indiana Jones and the Photosynthesis Worksheet: Using Portfolios to Preserve Discipline Specific Knowledge”
 Consultations with Other Campuses:

- Learning and Academic Skills Centre, Taylor’s University Malaysia
  - Eshodha Ann Andrew, Head
- University of Central Florida, Orlando, FL
  - Delaine D. Priest, Associate Vice President for Student Development and Enrollment Services
- Ohio State University, Columbus, OH
  - Bernie Savarese, Director, Enrollment Services
- California State University, East Bay, CA
  - Lawrence Bliss, Director, Academic Advising and Career Education
- Harper College, Palatine, IL (campus visit)
  - Ellen Fisher, Assistant Manager, Academic Support Services
- Purdue Calumet (campus visit with seven of Deborah’s colleagues)
  - Deborah Beal, Manager, Student Academic Support
- North-west University, Vaal Triangle Campus, Vanderbijlpark, South Africa
  - Dine du Preez, Student Advisor
- Clemson University, Clemson, SC
  - Laurel Whistler, SI Coordinator
- Western Washington University, Bellingham, WA
  - Vaughn Love, Resident Director

**YEARLY CYCLE & TIMELINE**

<table>
<thead>
<tr>
<th>Event/Training</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment for next semester’s leaders</td>
<td>March or October Callouts</td>
</tr>
<tr>
<td>Group Interviews</td>
<td>March or October</td>
</tr>
<tr>
<td>Individual Interviews</td>
<td>April or November</td>
</tr>
<tr>
<td>Hiring Completion</td>
<td>December or May</td>
</tr>
<tr>
<td>Pre-semester Leader Training</td>
<td>Thursday and Friday prior to the start of classes</td>
</tr>
<tr>
<td>Monthly Leader Training</td>
<td>Monday evenings beginning the 3rd week of the semester and then every 3 weeks</td>
</tr>
<tr>
<td>Semester Report Completion</td>
<td>Two months following the end of the semester</td>
</tr>
<tr>
<td>Recruitment of In-need SI Courses</td>
<td>September and February</td>
</tr>
<tr>
<td>End-of-academic year Celebrations</td>
<td>May – during exam week</td>
</tr>
<tr>
<td>Faculty Interviews</td>
<td>Mid-semester</td>
</tr>
<tr>
<td>Leader Observations and Follow-up</td>
<td>Throughout the semester</td>
</tr>
<tr>
<td>Training Planning and Preparation</td>
<td>December and July</td>
</tr>
</tbody>
</table>

**BENCHMARK PROGRAMS**

Supplemental Instruction benchmarks against the following programs:

- Clemson University, Clemson, South Carolina – regular collaborations with their program coordinator - their program is continually striving to improve student learning and self-regulation
  a. We are beginning to place a greater emphasis on student learning and being able to assess that more thoroughly and consistently
  b. Clemson’s model of tiered management is a model for future growth of our program
- University of Missouri Kansas City, International Center for SI
Texas A&M University, College Station – similar in size to Purdue and has some of the same challenges
   a. Texas A&M has a tiered model of supervision from which we can learn
   b. Their regional conference has many ideas for making SI sessions and training more effective

Supplemental Instruction aspires to benchmark against the following programs:
   • PASS: Peer Assisted Study Sessions: University of Manchester, England
     www.manchester.ac.uk/studentaspartners - this university has over 900 SI leaders who volunteer their time just to have the experience on their resumes
   • Ohio University, Athens – Purdue’s benchmarking trip noted this program as exemplary – our new assistant brings a wealth of information from Ohio U
   • North-west University, Vaal Triangle Campus, Vanderbijlpark, South Africa
     a. Their online leader training is exemplary – we are gaining ideas for implementing ours

Supplemental Instruction also utilizes the following resources to stay up-to-date on research and best practices:
   • International Center for Supplemental Instruction: UMKC http://www.umkc.edu/asm/si/si-docs/sibib.htm
     o David Arendale’s Annotated Bibliography http://www.arendale.org/storage/pdf-documents/peer/Peerbib03-2012.pdf
   • SI Listserv: UMKC – International Center for SI
   • LSAC listserv: Learning Specialists Association of Canada
   • FYE listserv: First Year Experience
   • ACPA listserv: American College Personnel Association
   • PACADA: Purdue Academic Advising Association
   • Journal: Research in Higher Education

OPPORTUNITIES FOR FUNDRAISING AND DEVELOPMENT
   • Expand the program by five sections of courses in the spring 2015 semester, ten in the fall 2015 semester, and by fifteen in the spring 2016 semester
   • Continue cost-sharing partnerships with academic departments who express a desire to have leaders in some of their tough courses
   • Partner with existing academic assistant programs such as Science Bound to better meet the needs of students
   • Implement an online training for student leaders so that the two-day training can be almost entirely experiential.