

## *SUPPLEMENTAL INSTRUCTION FOR BIO 101*

### **Executive Summary**

Initial results show success if students will take advantage of this opportunity. College policies to make this a mandatory intervention or find other methods to ensure student participation are being explored.

### **Development and Implementation**

**Training:** Achieving the Dream sponsored a two-day workshop in Supplemental Instruction conducted by a licensed trainer from the University of Missouri at Kansas City and attended by 11 members of the college community on August 7 and 8, 2007. The director of the college's GAIN program and the GAIN tutor coordinator were trained as SI supervisors at this time. Two of the college's biology instructors also received training in general SI principles and as SI Leaders so that they could help train student SI Leaders.

**Coordination:** Faculty training and implementation of Supplemental Instruction initiatives were coordinated by the chair of the AtD Learning Communities and Active Learning committee.

**Development:** Through initial research conducted during year 1 of the Lumina Grant, we learned that General Biology acts as a gatekeeper course for students enrolled in the college transfer programs. Working with two of the college's biology instructors and personnel from the college's GAIN program, the AtD Learning Communities and Active Learning committee developed plans to implement a pilot initiative for using SI with students taking General Biology I and II (BIO 101 and BIO 102).

#### **Implementation:**

**Fall 2007:** MECC piloted the use of SI with three on-campus, day sections of BIO 101, General Biology 1, using two student SI leaders and one adjunct faculty member serving as an SI Leader. Student SI Leaders were recruited by biology faculty members and were selected based on their performances in previous biology classes at the college. Student SI leaders were paid an hourly wage based on the rate applied to tutors in the college's GAIN program. The adjunct faculty member also developed SI session "lesson plans" for use by the student leaders. The three SI Leaders conducted 12 SI sessions per week during 4 different time slots. SI sessions were scheduled based on feedback from BIO 101 students regarding the times during the week that would be most convenient for them to attend SI sessions. This feedback was gleaned from surveys administered in the BIO 101 classes during the first week of class.

SI participation was not mandatory. Students could choose how frequently they wished to attend SI, or could choose to not attend at all. However, the biology instructors encouraged students to attend on a regular basis and shared data with their classes about the positive effects of SI. Daily records were kept of attendance at SI sessions to monitor the use of and the effectiveness of SI.

**Spring 2008, Fall 2008, Spring 2009:** We have continued to offer SI to students in all on-campus day classes in both BIO 101 and BIO 102 during these semesters. We used the same

procedures for recruitment of student SI Leaders and for scheduling and record maintenance a.outlined above.

### **Findings**

This intervention shows potential but as stated before, student participation appears to be the key to its success for the greatest number of students. Data are not available for fall 2008 due to the inability to acquire student attendance records from one of the SI student leaders; an issue related to finding sufficient, qualified, responsible participants.

### **Table Describing Student Outcomes**

#### **Supplemental Instruction for Biology 101, Fall 2007**

#### **Student Outcomes for BIO 101, Day Sections, Fall 2004 - 2007**

<b>Fall Term</b>	<b>Number of Students</b>	<b>Average Course Grade</b>	<b>Withdrawal Rate</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
<b>2004</b>	<b>118</b>	<b>1.89</b>	<b>22%</b>	<b>2.31</b>	<b>60%</b>
<b>2005</b>	<b>99</b>	<b>1.65</b>	<b>21%</b>	<b>2.06</b>	<b>58%</b>
<b>2006</b>	<b>93</b>	<b>1.64</b>	<b>22%</b>	<b>2.18</b>	<b>63%</b>
<b>2007</b>	<b>78</b>	<b>1.39</b>	<b>12%</b>	<b>1.96</b>	<b>61%</b>

#### **Student Outcomes for All BIO 101 Sections, Fall 2007**

<b>Sections</b>	<b>Number of Students</b>	<b>Average Course Grade</b>	<b>Withdrawal Rate</b>	<b>Fall GPA</b>	<b>Credit Hrs Pass Rate</b>
Day SI	14	2.0	7%	2.43	78%
Day Non-SI	64	1.25	12.5%	1.84	57%
Off-campus	17	2.63	6%	2.54	72%
Night	16	3.10	19%	2.25	57%
Web	33	2.0	30%	2.5	62%

### Start-Up and Continuing Cost for the Intervention

<b>Description of Expense</b>	<b>Unit Cost (exact or range)</b>	<b>Total Units</b>	<b>Cost</b>
Consulting services from University of Missouri			\$4,016
Travel for consultants from University of Missouri			\$570
Stipends for faculty involved in SI training during summer, plus FICA for two stipends	\$500 for each session	3	\$1,577
Adjunct faculty to support start-up of SI			\$1,860
<b>Total Cost</b>			<b>\$8,023</b>

### What we learned while implementing this intervention

**Student Engagement:** Students who regularly attended SI sessions during the course of the study improved their grades in the biology class and had a higher success rate than students who did not attend SI or who attended only occasionally. All students who attended SI sessions gave positive responses to a Likert scale survey designed to assess student satisfaction with SI. However, a very low number of students attended SI sessions regularly in all semesters.

**SI Coordination:** Each semester the biology faculty recruited student SI leaders from among their previous students, and the college's tutoring coordinator coordinated SI scheduling and maintained records. Other than ensuring that these tasks were completed, little additional coordination was required of the AtD Learning Communities and Active Learning committee. In short, the two biology instructors and the tutoring coordinator knew what to do and did it.

**Recruitment of Student SI Leaders:** The only obstacle we encountered was with recruitment of student SI leaders. Most semesters it was a challenge to find qualified students who were willing to lead SI sessions. However, we always managed to find a sufficient number of student leaders to adequately cover the planned schedule of SI sessions.

## **Faculty, Administration and Student Conclusions Regarding Outcomes and Faculty and Administration Conclusions Sustainability**

**Faculty Assessment of the Initiative:** Both of the biology instructors involved in the initiative feel that SI has the potential for success. In an email memorandum to the coordinator of the AtD Learning Communities and Active Learning committee, one of the biology instructors wrote the following:

The students who attended SI on a regular basis benefited from the extra help. Their grades were better than that of the class in general. One semester they were a whole letter grade higher. (I couldn't tell you about other semesters, because I didn't always get list of names for each exam.)

The problems with SI are getting students to attend the session. Whether the sessions are in the morning, afternoon, or scheduled to overlap the labs so that students can go from lab to session, students aren't going. A few students go on a regular basis, but the majority would only attend right before an exam, which is usually too little too late. The other problem is getting SI leaders. We both [both biology instructors] think that it is a good program and we would like to see it continue, but we need to find a strategy to get the students to attend the sessions on a more regular basis.

### **Conclusions by the AtD Learning Communities and Active Learning Coordinator:**

**Student Engagement with Supplemental Instruction:** According to MECC's AtD Coach, other colleges have had substantial success with Supplemental Instruction when students were required to attend SI sessions. We have certainly seen that voluntary attendance at SI sessions has not produced the desired effect. Despite our efforts to schedule SI sessions at times that will accommodate the majority of day students, regular attendance remains appallingly poor. Should the college decide to continue offering Supplemental Instruction, some means to increase student attendance must be found. Otherwise, the initiative may continue to affect too few students.

**Sustainability:** Supplemental Instruction is a relatively low cost and relatively easy initiative to sustain. Staff involved with SI should receive formal training in its use. Since our current GAIN tutor coordinator was not employed by the college at the time other staff received SI training, it is recommended that she attend SI training at the University of Missouri. However, she does currently have access to all of the training manuals and other SI documents provided during formal training. The same would be true for new biology instructors or other faculty on campus should they become involved with SI in the future.

Other than the initial cost of staff training, the only other budget implication is paying student SI Leaders, but this cost is minimal. Of course, should SI be extended to involve additional

programs and courses, the cost would also increase. Currently GAIN program staff members are willing to take on the additional responsibility of scheduling, coordination, record keeping, etc. related to our SI initiative in biology classes. However, if SI were expanded on campus, this would likely prove to be too much of a burden for the GAIN program staff and a full-time or part-time coordinator could be required.

Perhaps the greatest question regarding sustainability of SI is student engagement. If the college cannot find a strategy to improve student attendance at SI sessions, the initiative should not be continued. One of the keys to the success of SI is active student involvement in learning through small group discussions and activities, the same principles that drive the success of effectively structured collaborative learning. In fact, SI is an offshoot of collaborative learning. With very low attendance at SI sessions over the past two years, sometimes only one or two students per session, often SI sessions would become tutoring sessions rather than true SI sessions. Should this trend continue, the college's GAIN tutoring program should be able to handle the needs of most biology students seeking additional assistance with course content without the need of SI. Only those who do not qualify for GAIN assistance would be denied access to help outside the classroom. However, the biology faculty are also more than willing to work with students one-on-one outside the classroom.