



Advice on Implementing Supplemental Instruction in an Introductory Level Economics Course

Supplemental Instruction (SI) is a program where a current undergraduate student assists a professor in delivering course material by providing a peer-delivered format. The use of SI has varied across disciplines and there are many examples of its success (Blanc, DeBuhr, and Martin 1983; Wright, Wright, and Lamb 2002). This paper provides a critical examination of the implementation using views from both the SI leader's and the professor's perspective, a description of SI, and the authors' personal experiences with the program at Western New England College.

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1. Introduction

The Supplemental Instruction (SI) Program recruits undergraduate students to supplement a professor's delivery of course material. At larger, research institutions, professors are familiar with using graduate students to assist in the delivery of course material through recitations and office hours. However, at smaller teaching schools, the administration boasts to potential students that all classes are taught by professors and not by graduate students. The SI Program does not intend to replace the work of a professor nor to mimic the role of a teaching assistant at a research university, but rather to serve as a complement in the course delivery. Thus, neither administrators nor professors should fear adopting SI for their classes. This paper describes the program and research supporting its successes, how the authors implemented SI at Western New England College, and a critical analysis of the implementation by both the professor of record and SI leader providing advice and suggestions for those considering implementation. This paper intends to relay personal experiences from both the professor of record's point of view and the SI leader's point of view.

2. Overview Of Supplemental Instruction

SI was developed by Deanna C. Martin at the University of Missouri, Kansas City in 1975 (Topping, 1996). The program provides a valuable learning resource where students can increase their levels of understanding in those courses that historically present difficulties. SI enhances student learning with an alternative way to learn material that students are struggling to grasp. Not only is the class content delivered in the traditional classroom setting by the professor of record, but meaningful sessions are held multiple times a week by the SI leader to give a more personal feel for learning the material and an opportunity to stress key ideas.

During these optional sessions, students have access to a fellow undergraduate student, known as the SI leader, who performed well in the course previously. Having taken the course recently, the SI leader can relate to the students, provide information on effective study strategies, and share tips to handle the difficulties in the class. The sessions conducted by the SI leader provide greater opportunities for peer learning, given the leadership of a fellow student. The SI leader attends all lectures to fully understand the exact materials covered in lecture. This allows the SI leader to be in touch with the topics covered in the class and grants insights to topics that the students appear to be struggling to understand. Attendance by the SI leader is not required, but highly advised and encouraged. By attending the regular class sessions and meeting with the professor, the SI leader has more than enough resources to provide the additional help needed for students struggling with the course material.

At Western New England College (where the authors participated in the SI Program), before a SI leader is chosen, the participating department seeks applications from eligible students. In this model, the program is run out of a central location (Office of First-Year Students) and departments participate by allowing the program in designated classes. Thus, the management and training of the SI leaders is handled by the Office of First-Year Students rather than an individual department. After this process, the leaders go through a week of training where they learn the objectives of the program, how to implement the program, and helpful tools to help them throughout the semester. During the training the leaders are briefed on many topics ranging from teaching methods to how to deal with certain classroom situations that may arise during instruction. This training helps the leader during the SI Program and also provides information that can be related to future jobs and classes the leader takes outside of the position. After completing the training program, the SI leader attends the first day of the professor's class

to help promote the program and attendance. At this time, the SI leader gathers information about the students' schedules in an attempt to choose meeting times that can maximize attendance.¹ Then, the SI Program begins with the professor running a class just like any other term and the SI leader conducting sessions each week.

3. Effectiveness of Supplemental Instruction

One of the main purposes the SI Program serves in difficult courses is to increase retention. This objective is tracked by observing withdrawal and reenrollment rates for this course both with and without the program. Blanc, DeBuhr, and Martin (1983) examine 746 students in seven arts and sciences courses. The authors find that students who elect to participate in SI reenrolled at the university at a higher rate than students not using SI. Ogden, Thompson, Russell, and Simons (2003) examine 248 undergraduate students in introductory political science courses at a large, southern university. The authors show that students who had entered the school with a "conditional" status had a much higher reenrollment if they participated in SI as compared to those who did not. These programs can also help retention. Boylan (1997) finds a much larger retention rate (66.4 percent) for students passing a single developmental course compared to students who do not pass a developmental course (9.6 percent).

Another objective is to improve student grades in these courses. This objective can be tracked by observing average grades in the courses with and without the program. The study by Blanc et al. (1983) shows a higher course GPA for the students who participate in SI. Ogden et al. (2003) estimate a predicted GPA for "conditional" students using high school grades, previous freshman class grades, and SAT scores. The authors find that the "conditional" students attending SI performed better relative to their predicted GPAs than students who did not attend. Wright, Wright, and Lamb (2002) collect data from 90 developmental mathematics courses with 11,000 students. The authors find that the students participating in SI had lower SAT/ACT scores, but a higher percentage of As, Bs, and Cs in the courses.

A major criticism of the studies examining the effectiveness of SI is that the studies fail to account for self-selection bias (Bowles and Jones, 2003). However, Loviscek and Cloutier (1997) examine Principles of Microeconomics courses to investigate this bias. Using transcript data as control variables, the authors find evidence of a significant, positive difference in performance for students participating in SI. When testing for a self-selection bias, the authors find that traditional OLS estimation underestimates the impact of SI. Thus, using several different measures of effectiveness and even correcting for a potential problem of self-selection, there is evidence of the effectiveness of SI at different schools and across disciplines.

4. Personal Experiences at Western New England College

Western New England College implemented the SI Program in several courses, including a few of its Introduction to Economics courses. Western New England College² is a small, private college in Springfield, Massachusetts. The school has a School of Arts and Sciences (where the Department of Economics is housed), a School of Business, a School of Engineering, a School of Pharmacy, and a School of Law. There are approximately 3,700 students of which 2,500 are

¹ The selection of times can vary from school to school. The authors represent their experiences and achieved high levels of participation using this method. However, it is acknowledge that other methods may yield greater results.

² The school has since changed its status to a university.

full-time undergraduate students. Around 70 percent of the full-time undergraduates live on campus.

Each of the authors' first experience with SI occurred when the Office of First-Year Students identified the Principles of Microeconomics course as high-risk and suggested SI leaders should be assigned. According to Congos and Stout (2001) a high-risk course is defined as one that is considered traditionally difficult or has a D, F, and withdrawal rate of 30 percent or greater for several academic terms. The office asked if professors were willing to use SI. During this year, the only professor who agreed to use SI in an economics course is an author of this paper. The Office of First-Year Students approached students recommended by the department to become leaders. The other author of this paper agreed to be an SI leader and served as such for two Principles of Microeconomics courses during the same academic semester. Given the experiences of the authors, there is a perspective from the professor and from the SI leader in this paper.

5. Implementation Advice Based on the Authors' Experiences

Since the implementation of SI at Western New England College, the SI leader attended graduate school and is now a professor at a large, state university. The professor moved to a different university and implemented SI there. Given these experiences, the authors have different perspectives on advice for implementing SI. This section provides ideas for instructors interested in implementing SI on how to make it effective based on the experience gained from both a professor of record and a SI leader.

First and foremost, the professor and the SI leader, along with the school as a whole, need to be promoters of the program. Session attendance is optional and students need to be provided with an incentive to attend the sessions. This incentive does not need to be in the form of extra credit, which can make some professors hesitant to implement an SI program. One form of promotion is to cite the success of other professors within the school or personal acquaintances who have implemented SI. Another is to provide the evidence of successes that was documented earlier in this paper. The professor, the SI leader, or the coordinator who oversees the SI program could contact a previous student to create a short video testimonial on the importance of attending the sessions.³ Finally, the most important way to provide an incentive to attend is to make sure the sessions are adding value for the students. When the students understand that attending sessions will increase their understanding of the material and will lead to higher test scores, they will value the sessions and have a greater probability of attending. Each professor should have some idea of the types of incentives that the students respond to at their school. A professor and an SI leader should use one or more ideas to promote attendance. For the first semester SI was incorporated in economics at Western New England College, the authors focused on explaining the potential benefits and used an incredible amount of energy when touting the successes of the program nationally. Once the program had been successfully implemented, the authors brought former students to talk with the class about their experiences on the first day of class. These students focused on how much the sessions assisted them with course. Without promotion, the sessions could end up being a great, but untapped, resource.

Preparation and communication cannot be understated. It is useful for the professor and SI leader to meet at least once a week to build a relationship. These meetings should be used to go over topics that will be covered in the course and review any topics that the SI leader ex

3 Some strategies for marketing can be found at <https://www.youtube.com/watch?v=c1OtvfmeQf4>

presses any doubts in covering. It is important for the professor to encourage questions from the SI leader. The biggest mistake that an SI leader can make is to give false information in a session. Thus, a professor has to make sure that the SI leader is comfortable asking any type of question, even if it is one that the professor believes any student who has completed a principles course should know. An experienced professor will have a good idea of the topics that are typically difficult for students and should share this with the SI leader. The professor should go over any class assignments with the SI leader making sure the leader knows what the professor will be looking for in responses. This will better prepare the SI leader in creating examples to go over in sessions and being better able to stress the types of responses the professor seeks. The sessions should not simply be doing homework assignments but rather helping students understand the material and being prepared to do the assignments. Finally, the SI leader should attend each lecture if schedules permit. Given past experiences of leaders who were unable to attend lectures due to scheduling conflicts, the benefits of attendance are great.

The State University of New York at Cortland provides a packet⁴ with helpful advice to SI leaders through the creation of a list of what to do and what not to do. In the authors' experience, the professor stresses a few items that a professor must and must not do. First, a professor needs to leverage the skills of the SI leader and treat the relationship as a partnership. The SI leader is not someone that the professor should be competing with, nor attempting to criticize in order to raise his or her status. The professor should offer to provide the SI leader with feedback, rather than simply checking to make sure that a task is being accomplished. Professors generally have a wealth of experiences in the classroom and can quickly advance the SI leader's knowledge of interacting with students. A professor should not allow students to complain about the SI leader. If a student is having an issue, then the professor should encourage a meeting between the professor, the student, and the SI leader. The professor should never ask the SI leader to teach one of the course lectures nor perform any of the test or assignment creation or grading. The professor of the class still needs to perform all of the regular course tasks, and an SI leader is not a graduate assistant.

In the authors' experience, there are a few items that an SI leader must and must not do. In order to help students with different learning styles and to provide variety, SI leaders are encouraged to not run their sessions as lecture-based. Great sessions are interactive and provide a different approach than the one being provided by the professor. Also, sessions should attempt to cover problematic material rather than the material students have mastered or are comfortable in discussing. SI leaders can increase participation and gain an understanding of the students' struggles by using one of the "free" online polls (Stowell & Nelson, 2007). With this approach, the leader prepares to discuss several topics and then chooses the topics with the lowest scores in the poll results. This approach allows an efficient allocation of session time with respect to student difficulties with material.

The authors suggest that active learning should be the focus of each SI session. The SI leader should never stop trying to make the sessions engaging to keep attendance at a high level and to encourage the students to learn economics at a deeper level. There are several short activities that encourage the active learning of economic topics that are traditionally difficult for students to grasp (Tierney, 2016; Grant, Bruehler, & Chiritescu, 2016; Geerling & Mateer, 2015; Geerling et. al., 2014; Geerling & Mateer, 2014). Another way the SI leader can increase the engagement in each session is by using media to emphasize important topics. There are many papers discussing the use of media in the classroom (Mateer, Ghent, and Stone, 2011, Mateer and Li, 2008, etc.) as well as websites where media are made available (Ghent, Grant, Lesica, 2010; Kuester, Mateer, Youderian, 2014; Mateer, 2012; Tierney, Mateer, Geerling, Wooten, and

4 <http://www2.cortland.edu/dotAsset/96e68d62-c1fd-4683-9d6f-fc4f271fddce.pdf>

Smith, 2016). Finally, SI leaders should not hesitate to use different forms of social media to enhance learning. Professors and SI leaders should read some of the available literature on using Facebook and Twitter in the classroom in order to avoid some of the potential problems (Kassens, 2014).

As a quick reference, the authors' suggestions are shown in Table 1.

Table 1 – Recommendations for Professors and SI Leaders

<p>A Professor Should:</p> <ul style="list-style-type: none"> • Promote the program and session attendance. • Meet with the SI leader as often as possible to increase communication. • Treat the SI leader as a partner in increasing learning, rather than a competitor. • Offer feedback to improve SI sessions. • Review any class assignments and identify any topics where students typically struggle. • Attempt to build a personal relationship with the SI leader. 	<p>An SI Leader Should:</p> <ul style="list-style-type: none"> • Promote the program and session attendance. • Attend lectures if schedules allow. • Prepare for each session. • Not be afraid to fail and not be afraid to answer "I don't know." • Use active learning techniques.
<p>A Professor Should Not:</p> <ul style="list-style-type: none"> • Treat the SI leader like a graduate teaching assistant. • Allow students to criticize the SI leader. 	<p>An SI Leader Should Not:</p> <ul style="list-style-type: none"> • Attempt to improvise a session. • Criticize the professor. • Agree to create any course homework assignments and/or exams nor agree to teach a course lecture.

6. Conclusion

Many economics professors are unwilling to adopt new methods of teaching or participate in alternative delivery programs due to an expectation of additional time and skepticism regarding effectiveness (Becker and Watts, 1996 and 2008). While it is true that participating in a program such as SI demands an initial time investment, the authors feel the benefits outweigh the cost, especially in the long run. The time commitment is spent relaying the appropriate information about the program to your students and coordinating the efforts of the SI leader and the instructor. If done properly, the SI Program can save a professor time and it can improve student understanding of the material. Hopefully these suggestions provide enough insights

to convince those who are approached with the opportunity to participate in the program to take full advantage of that opportunity.

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