

Claflin University

Programs for the Retention and Enrichment of Science,
Engineering and Mathematics students (PRESEMs)

Supplemental Instruction in Mathematics

George Miller

Angela W. Peters

Pamela Shuler

Zia Hasan

David Drumheller

Project Investigator

Project Director

Project Manager

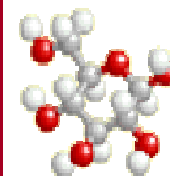
Evaluator

Evaluator

CLAFLIN UNIVERSITY
ORANGEBURG, SOUTH CAROLINA



CLAFLIN UNIVERSITY
ORANGEBURG, SOUTH CAROLINA



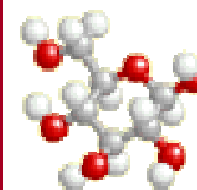
Claflin University

Claflin University, the oldest HBCU in the state of South Carolina, has a long tradition of providing basic education in the sciences for underrepresented students. U. S. News and World Report ranked Claflin “#1 Best Value and #3 among Americas Best Comprehensive Colleges in the South”. The university has an impressive 68% graduation rate and high retention rate of 80%.

Claflin University has invested resources and manpower into the success of students in mathematics. **Our president, Henry N. Tisdale, is a mathematician who understands the link between mathematics and the world. We therefore used Supplemental Instruction (SI) as a powerful change agent that has transformed high risk mathematics courses into academic success routes.** College Algebra and Pre-Calculus are two high risk courses that have a high rate of D or F grades and withdrawals. With a 54% overall failure rate for both courses we were eager to utilize an instructional model with proven success for fostering student learning.



CLAFLIN UNIVERSITY
ORANGEBURG, SOUTH CAROLINA

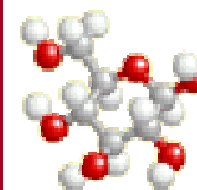


Failure Rates in High-Risk Courses (pre-HBCU-UP)

Course	98-99	99-00	00-01	Average
Chemistry	51 (98)	45 (95)	43 (100)	46%
Physics	38 (25)	40 (25)	40 (24)	39.3%
Pre-Calculus	56 (85)	57 (88)	41 (90)	51 %
College Algebra	60 (125)	55 (140)	56 (140)	57%



CLAYTON UNIVERSITY
ORANGEBURG, SOUTH CAROLINA

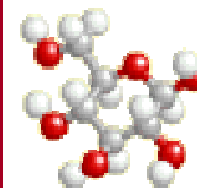


Supplemental Instruction in Mathematics

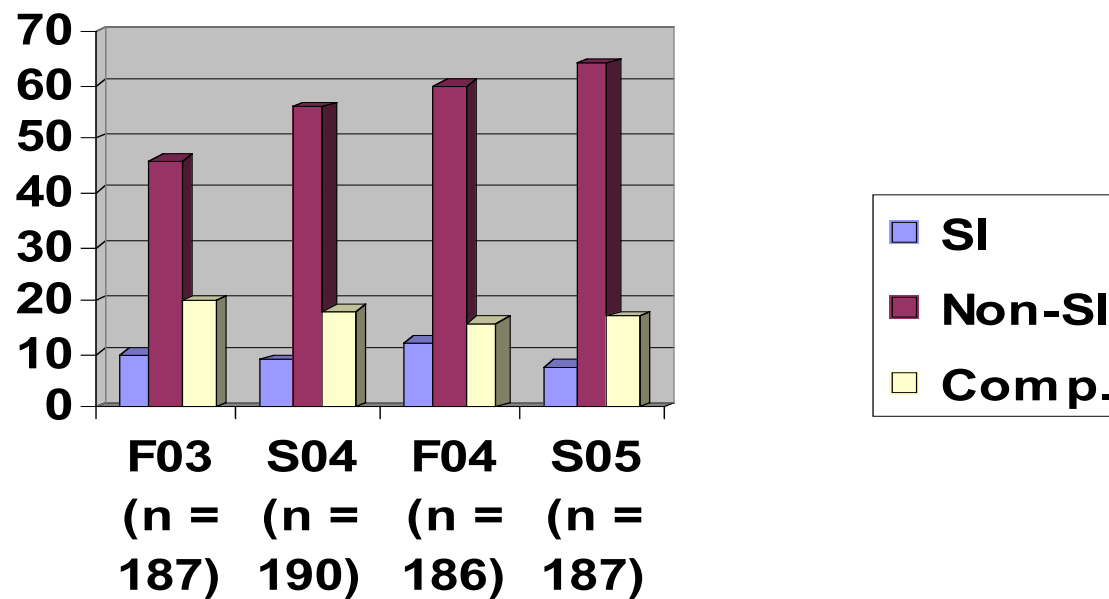
- The SI program targets difficult academic courses – those that have a 30% or higher rate of D or F final course grades and/ or withdrawals- and provides regularly scheduled, out-of-class, peer-led sessions that offer students an opportunity to discuss and process course information. Since the SI leaders are students who have already taken the course from the same instructor (usually), they are able to act as guides with first hand experience. They provide structured study sessions related to course contact as well as reassurance about the course in general. Students who receive less than a “C” on any exam in must attend SI sessions. Each failing exam will require a minimum of 6 SI sessions per exam. Courses will meet the following times (3 hour lecture; 3 hour SI session; 1 hour MathLab):
 - three times a week for a fifty-minute period with the assigned professor;
 - three times a week for a sixty-minute period with the SI leader, and
 - one time a week for a fifty-minute period in the MathLab for tutoring and recitation.



CLAYTON UNIVERSITY
ORANGEBURG, SOUTH CAROLINA

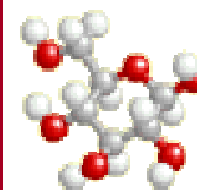


Failure rates (%) in College Algebra (D, F & W)

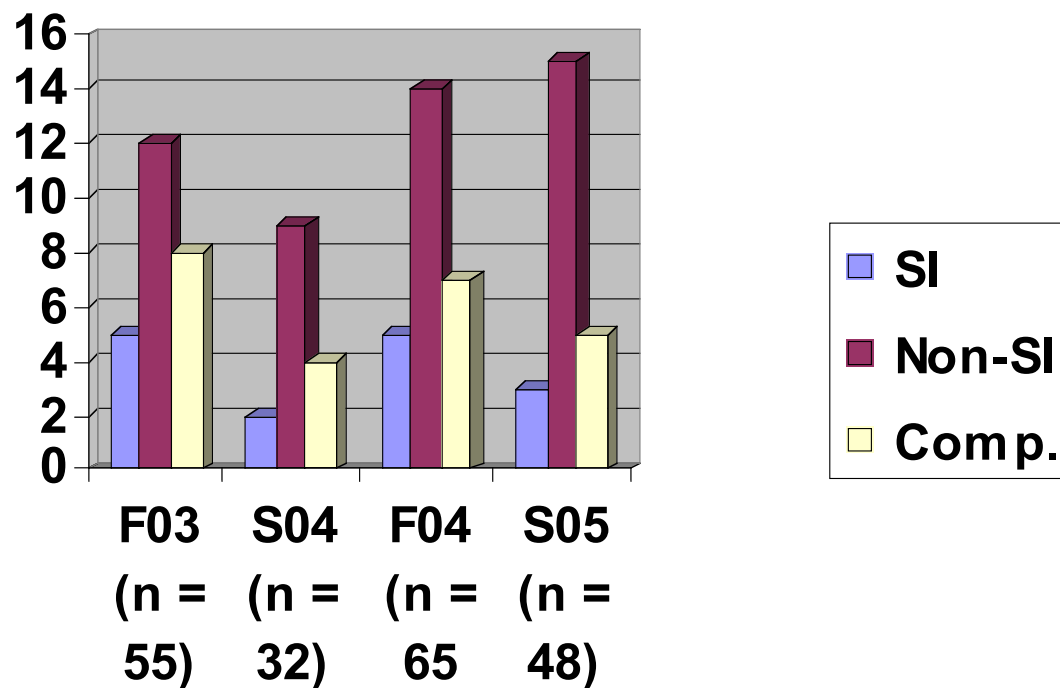




CLAFLIN UNIVERSITY
ORANGEBURG, SOUTH CAROLINA

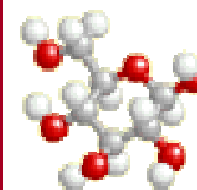


Failure rates (%) in Pre-Calculus (D, F & W)





CLAFLIN UNIVERSITY
ORANGEBURG, SOUTH CAROLINA



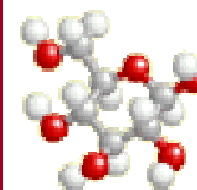
Failure rates (%) in Upper-Level Math Courses (D, F & W)

In a follow-up study, we tracked over 85% of students in the Pre-Calculus course in order to investigate their performance in upper-level mathematics courses. Students in this cohort were pre-majors within SNSM. They are not accepted into the major until the successful completion of the freshman year courses. Results indicate that the same students who previously received SI and MathLab passed upper level mathematics courses i.e. Calculus I & II, Discrete Math, Statistics and Probability, at a higher rate than non-SI students. Interestingly, 50% of these students who were not involved in SI strategies from previous math courses, did not pass Calculus I.

	SI (n = 42)	Non-SI (n = 131)
AY 03-04	45%	55%



CLAFLIN UNIVERSITY
ORANGEBURG, SOUTH CAROLINA



Conclusion

Students who attended SI sessions received higher final course grades (average of 12.5 points higher) and more students remained in the course as opposed to non-SI participants.

On a four-point scale, the mean final grade of College Algebra was 1.75 and Pre-Calculus was 1.49. Students who attended SI sessions received a higher mean final grade (2.35 vs. 1.15 for College Algebra; 1.98 vs. < 1.0 for Pre-Calculus) and they passed the courses at a higher rate (92% vs. 30%) than non-SI participants.

The current success of SI at Clafin in College Algebra, Pre-Calculus, General Chemistry and Physics (high-risk courses) has resulted in decreased failure rates of 15%, 10%, 13% and 13%, respectively (Peters et al, *Journal of Women and Minorities in Science and Engineering*, Vol. 12, Issue 1, 2006). Students who attended SI sessions passed at a rate of 20-25% higher than students not attending SI. The success of SI at Clafin has resulted in an institutional change for non-STEM majors. For the university, performance in General Education courses i.e. College Algebra and Pre-Calculus, equates to a higher graduation rate and retention rate.