

# How effective is our supplemental instruction program?

An evaluation study at a community college using mixed methods

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# Introduction - Supplemental Instruction

- **Origin:** Developed by Dr. Deanna Martin in 1973 at the University of Missouri at Kansas City (UMKC)
- **Purpose:** To increase student performance and retention in traditionally difficult academic subjects (DFW rates greater than 30%)
- **Development:** According to the International Center of Supplemental Instruction at UMKC, SI programs have been implemented in over 1800 institutions in 30 countries so far.

# Introduction - Continued

- Theoretical Pillars of SI:
  - Behavioral Learning Theory (e.g. Bandura)
  - Cognitive Developmental Theory (e.g. Piaget)
  - Social Interdependence Theory (e.g. Vygotsky & Erickson)
- Documented Benefits:
  - Short-term: increasing course academic performance (Feinn, 2004; Kochenour et al., 2007)
  - Long-term: increasing academic performance in subsequent courses (Gattis, 2000), graduation rates (Bowles, McCoy, & Bates, 2006), retention and persistence rates (Arendale, 1997; Peterfreund, Rath, Xenos, & Bayliss, 2008), study strategies (Eberling, 1998), and motivation and engagement (Mack, 2008; Peacock, 2008)

# SI in Citrus College

- Supported by the CCRAA HSI STEM grant, SI has been implemented as part of the effort to build a STEM pathway for its students.
- Started in Spring 2009

# Program Structure

Term: Spring 2009

Courses: BIOL105 and BIOL220

Personnel:

SI Supervisor: 1

SI Leaders: 9

SI attendants: 150

Term: Fall 2009

Courses: BIOL105, 200, CHEM  
103, 110, 111, 112, ASTR115,  
MATH 130

Personnel:

SI Supervisor: 1

SI Leaders: 24

SI attendants: 470



Internal Evaluation Team (IR Office)

# Research Questions

- Short-term benefits:
  - Do SI attendants achieve better academic performance than non-SI attendants?
  - Is the retention rate higher among SI attendants than non-SI attendants in the course they enroll?
- Long-term benefits:
  - Do SI attendants achieve better academic performance than non-SI attendants in subsequent courses?
  - Is it more likely for SI attendants to transfer?
  - Is it more likely for SI attendants to get an associate degree (AA/AS)?
  - Are the persistence rates higher for SI attendants?
- What are SI attendants' experiences with this program?

# Data and Methodology

- Spring 2009 and Fall 2009 students enrolled in courses with SI (N= 545 and N= 1,292)
- Qualitative: In-depth Interviews
- Quantitative: Descriptive Statistics, Chi-square Test, Logistic Regression, Nonparametric Test, etc.

# Quantitative Study Results – Spring 2009

- Course success rates were higher for SI attendants than non-attendants (74.7% vs. 65.6%).
- *Attending SI sessions and Passing the course* was significantly related ( $\chi^2 = 4.140$ ,  $df=1$ ,  $p=0.042$ ).
- SI attendants were likely to achieve higher level of grades than non-attendants (e.g. the probability of getting As and Bs are 1.5 times greater).
- The higher the frequency of attending SI sessions the higher the likelihood that a student obtained a higher level of grade (e.g. the probability of getting As and Bs are 1.1 times greater for each unit of increase in the frequency of attending SI sessions).



# Qualitative Study Results – Positive Experience

- **Better performance**

*“Usually I got like Bs in all my classes. But now it’s no way. It’s like I always get As in all my tests .” (Mary Kay)*

- **Better understanding of the course materials**

*“I like it because it helped to explain the materials better. Teachers just give out the information, but they (SI leaders) explain things more in detail.” (Sam Warner)*

- **Learning from different perspectives**

*“I think it’s nice to have different perspectives also ... It’s kind of ways to open up your mind to your study and look at different ways to really understand it. It’s a nice thing ... So it was not the book who took me one step beyond .”(Vivian Mighty)*

- **Staying more focused**

*“Yes, because at home when I study, I easily got distracted. But I know when I was there, that’s all I was focused on. So it really helps .” (Mary Kay)*

- **Increasing confidence**

*“I’m always kind of pessimistic at the first, because it sounds so overwhelming. But once you go through it, then you feel better about it as you go through it .” (Mike Orchard)*

# Qualitative Study Results – Contributing Factors to a successful SI program

- **Self-motivation**

*“So I think people who really go to the sessions are the ones who really are interested in understanding the stuff and who are going to get a better grade. It’s really hard to tell because giving you a better grade or she or he is the kind of person to begin with.” (Vivian Mighty)*

- **Frequency of attendance**

*“At least two or three (times per week).” (Sam Warner)*

- **SI leaders’ styles**

*“Yeah, I crave the structure and consistency, that’s why I go to the same SI leader. I crave consistence whenever I learn something. I went deeply in every single bit of detail before I can get it.” (Mike Orchard)*

- **SI session strategies**

*“For me, she handed out outlines and materials that are most helpful.” (Neal Shepherd)*

# Qualitative Study Results – Suggested Improvement for Future SI Sessions

- **Flexible session times**

*“No, you can go three days... And I only go Mondays and Wednesdays because I work. I work around my schedule.” (Mary Kay)*

- **Better advertising**

*“Just make it sound like more important because you know I feel like not enough people thought it is important enough. You know saying that it improves your grade 10% by going to five times at the end .” (Mike Orchard)*

- **Promoting favorable SI leaders’ styles**

*“I think there are certain SI leaders that come with more for you to kind of do. Like Emily, she comes with her sheets, so we have lots of more things we get to work together .” (Vivian Mighty)*

# Challenging Issues

- Low Attendance Rates

Only 27.5% of all eligible students participated in SI in Spring 09

- Low Frequency of Attendance

Over 50% SI attendants only attended the SI sessions either once or twice over a whole semester

- Styles of SI Leaders

Some SI Leaders had few or no attendants in their sessions

- High Turnover of SI Leaders

SI Leaders graduated and/or transferred to universities

# Addressing Challenges in Fall 2009

- Recruitment
  - Convenient Session times (Either immediate before or after class lectures)
  - New STEM Center
  - STEM Open House
  - STEM Guest Speaker Series
- SI Leaders
  - SI Leader Training
  - Increased Interactions among Students and SI-Leaders

## Initial Results and Further Improved Planning in Spring 2010

- Improved Attendance Rates in Fall 2009

Increased the attendance rate from 27% in Spring 2009 to 36% in Fall 2009

- Further Improved Planning in Spring 2010

- SI Mentors
- Pre-class testing for previous performance
- Motivated Strategies for Learning Questionnaire (MSLQ)
- Other issues based on Fall 2009 evaluation results

# Summary

- Unique characteristics of community college students and strategies for addressing their needs
- Recommended methods for assessing the SI program
- Assessment and implementation processes are dynamic and impacting each other

# Thank you!

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