

FOSTERING OPPORTUNITIES FOR TOMORROW'S ENGINEERS (FORTE)



John R. Reisel, Marissa Jablonski, Ethan Munson, George Hanson, Hossein Hosseini, Edward Beimborn
 College of Engineering and Applied Science
 University of Wisconsin-Milwaukee
 Milwaukee, WI 53201-0784



Project Goals:

- (A) Improve retention rate and graduation rate of students in Engineering and Computer Science.
 - Increase 1-year retention rates from ~58% to 80%.
 - Increase overall graduation rate of new freshmen from ~31% to 58%.
 - Increase overall graduation rate of new transfer students from ~46% to 70%
- (B) Increase enrollment, retention, and graduation of female, and under-represented minority students.
- (C) Foster Partnerships with local high schools
- (D) Contribute research to the effectiveness of specific strategies for improving retention and graduation rates.

Project Components:

- (A) Summer Bridge Program
 - Morning Focus on Math Improvement
 - Afternoon Focus on Engineering/CS
- (B) Peer Mentoring / Study Groups
- (C) Living-Learning Community
- (D) Student Recruitment
- (E) Faculty Mentoring
- (F) Evaluation

Acknowledgements:

Partial support for this work was provided by the National Science Foundation's Science, Technology, Engineering, and Mathematics Talent Expansion Program (STEP) under Award No. 0757055. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

The authors would also like to thank Todd Johnson, Tina Current, Sharon Kaempfer, Jenny Klumpp, Cindy Walker, and Dee Dee Wallace for their assistance.



Bridge Program – Participation and Progress:

Purpose: Improve the math placement of incoming freshmen students, and generate excitement for engineering and computer science studies.

YEAR	PARTICIPANTS	# IMPROVED MATH PLACEMENT	PERCENTAGE IMPROVED
2009	37	25	68%
2010	47	39	83%
2011	64	56	88%

Success rate for math course improvement (which should improve retention through reduced time-to-graduation) has been seen.

Changes made between 2010 and 2011:

- Use of additional mentor/instructors in the math classrooms.
- Assigned advisor specifically to these students.

Living-Learning Community – Participation:

Purpose: Provide a nurturing on-campus environment for freshmen students in engineering and computer science.

Sample activities:

- Guest Speakers
- Robotics/Media Production program with Discovery World Museum
- Dedicated, on-site study groups
- Common courses with some students

ACADEMIC YEAR	PARTICIPANTS	2 nd -YEAR RETENTION
2009-10	41	78%
2010-11	40	78%
2011-12	56 (+9)*	NA

*9 non-CEAS students in the LLC. 2 of these were STEM majors.

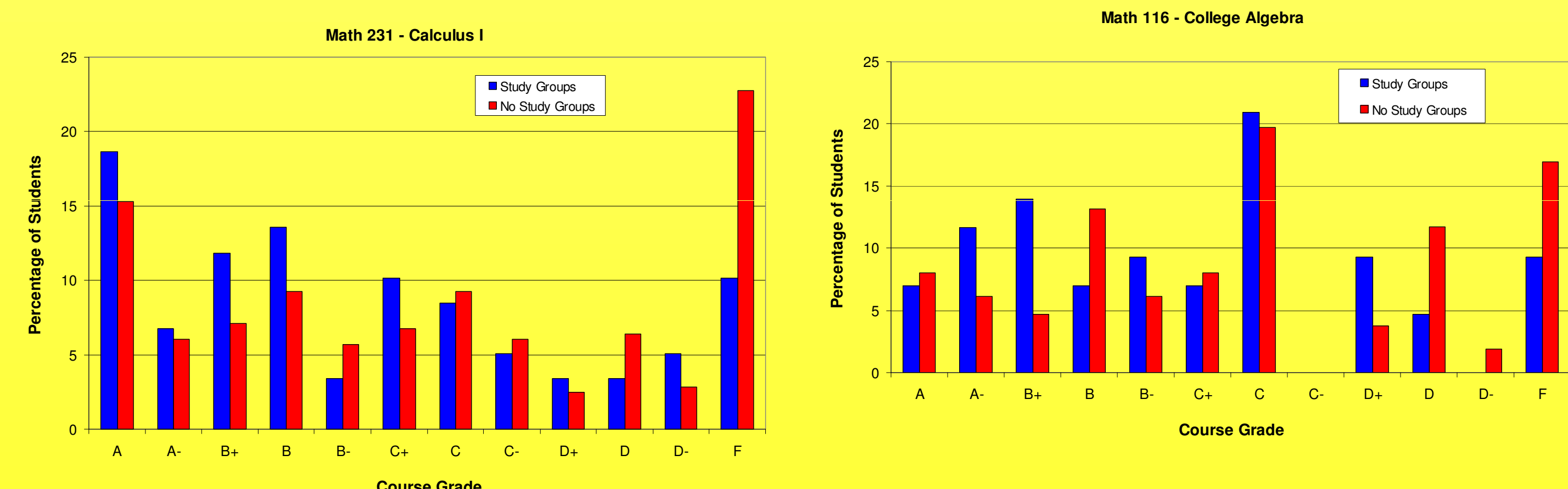
Study Groups – Participation and Progress:

Purpose: Provide additional math instructional support through small, undergraduate-led, study groups.

Study group size is 6-12 students, with groups formed around particular math courses. An undergraduate student facilitates the group, introducing problems to be solved and guiding the students in their solution techniques.

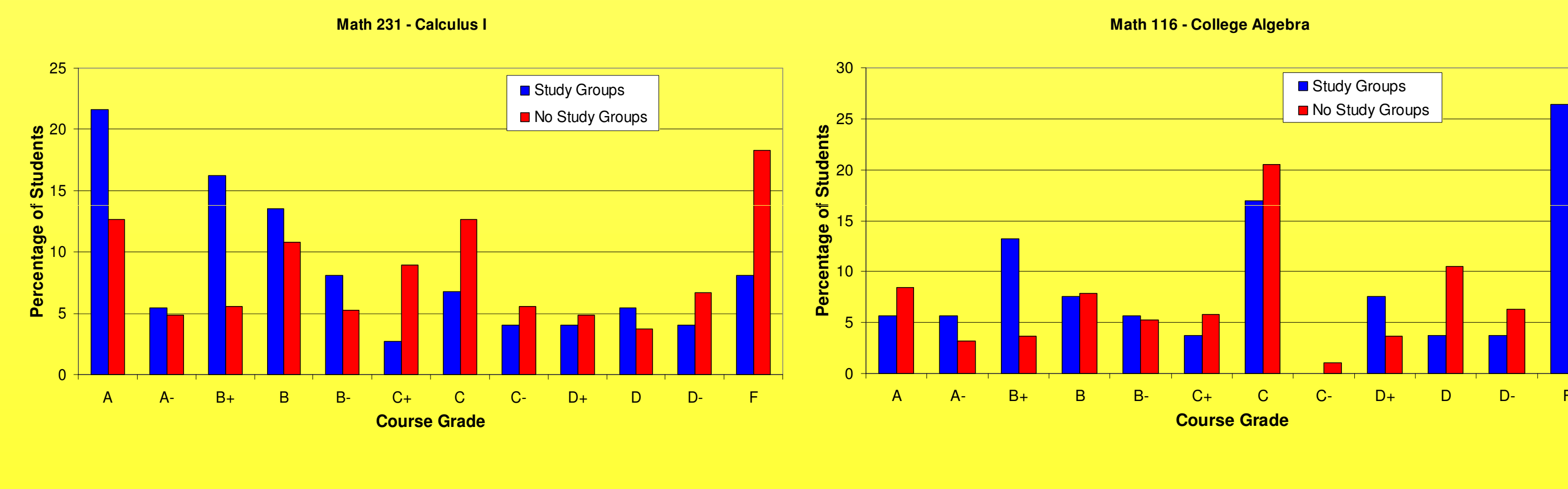
ACADEMIC YEAR	2008-09	2009-10	2010-11	2011-12
PARTICIPANTS	16	133	147	192
INCOMING FRESHMEN	263	218	202	233
PERCENT PARTICIPATED	6.1%	61.0%	72.8%	82.4%

Impact of Study Groups – Fall 2010:



Math Course	Participants' Course GPA	Non-Participants' Course GPA
231	2.49	2.06
116	2.38	2.02
117	2.78	2.20
105 (Int. Algebra)	2.86	2.37

Impact of Study Groups – Fall 2011:



Math Course	Participants' Course GPA	Non-Participants' Course GPA
231	2.63	2.04
116	1.84	1.71
117	1.82	2.28

Observations on Study Groups:

The Study Groups usually help produce substantially better performance, particularly in Math 231 (Calculus I).

The improvement was not as significant in the PreCalculus level during the Fall 2011 semester. Possible factors include poorer student preparation (more students) at this level, and the Math 117 instructors.

Greater participation in Fall 2011 partially attributable to more intensive advising of incoming freshmen.

Questions:

How can we better prepare students for the PreCalculus courses?

How can we further help students from the bridge program in their Fall math courses?