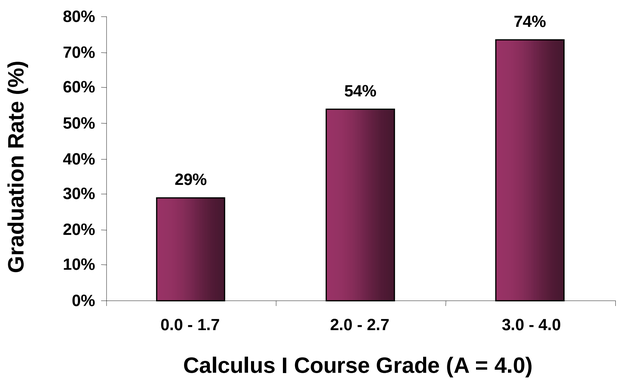
Intervention Strategy for Improving Success Rates in Calculus

Darryl Koch, Coordinator of Academic Support Services-University of Michigan
Gary D. Herrin, Ph.D., Associate Dean of Undergraduate Education-University of Michigan

Abstract

Given that performance in Calculus I is highly correlated to graduation success for engineering students at UM, we have implemented an intervention strategy to increase the student success rate in that course.

6-Year Graduation Rates of Engineering Students vs. Calculus I Grade (first attempt)

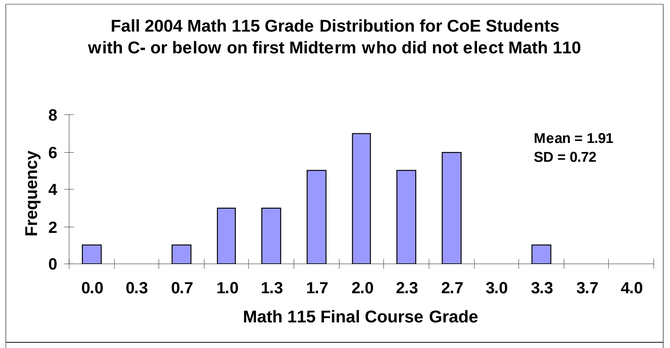


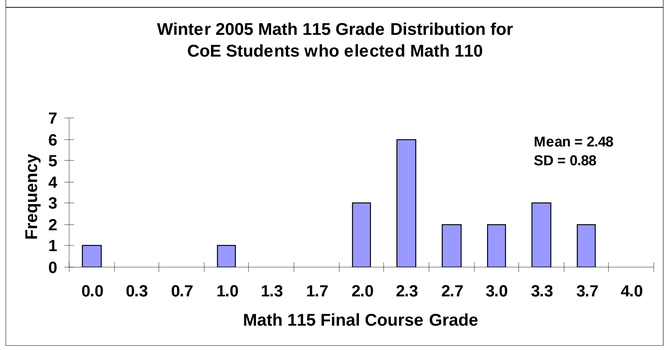
Methods

- Collaborate with Mathematics Dept. to identify all engineering students who receive C- or below on first Calculus I (Math 115) exam
- Contact those students and create group advising sessions conducted by academic advisors, learning center director, and calculus course director
- Offer option of half-term intensive pre-calculus refresher course (Math 110) with the following advantages:
  - Students receive 2 credit hours
  - Current enrollment in Math 115 is expunged with no detriment to GPA
- Work with calculus course director to assign experienced and effective instructor to the pre-calculus refresher course

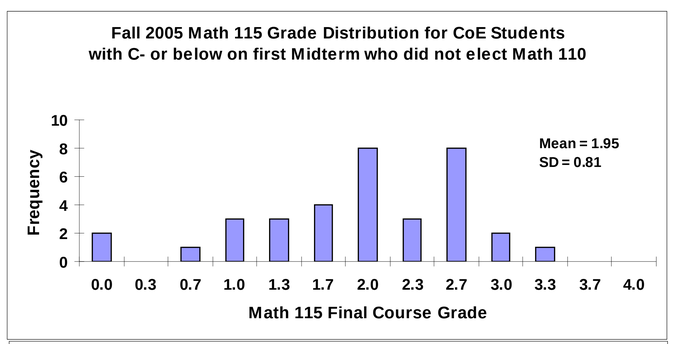
Results

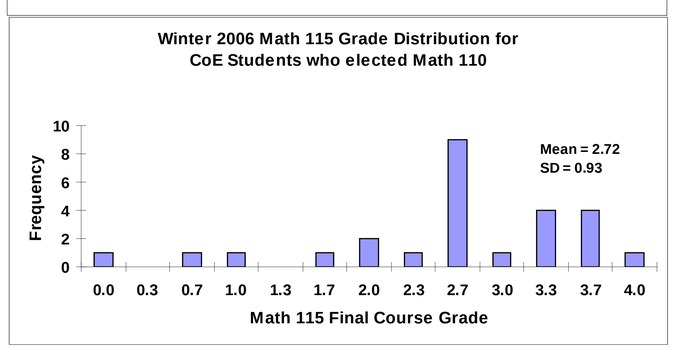
2004-05 Outcomes





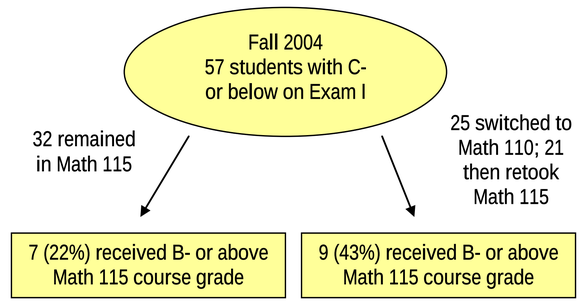
2005-06 Outcomes

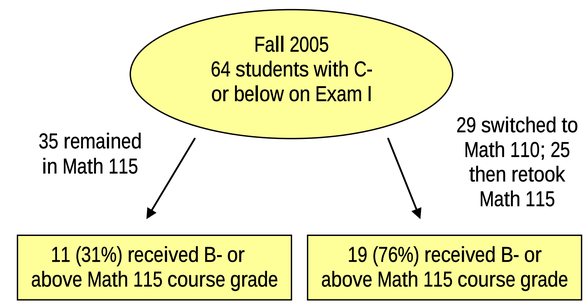




Discussion

Our data indicate that of the group of students who received a C- or below on the first Math 115 exam, those who switched to Math 110 and retook Math 115 had a much higher success rate in Math 115 compared with those who stayed in the course.





Conclusions

The Math 110 course has proven to be a successful intervention strategy for a critical first-year gateway course in engineering that will hopefully positively impact graduation rates. Further work should be done to develop and test intervention strategies for other barriers to academic success.

Acknowledgements

- College of Engineering
- Department of Mathematics

The "Research and Scholarship in Engineering Education: Poster Session" was sponsored by the office of the Associate Dean for Undergraduate Education.