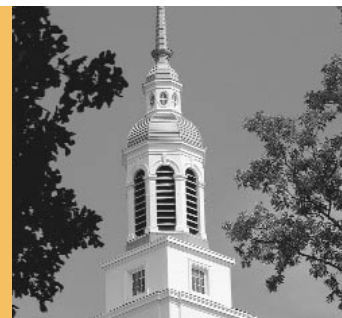


Berea College's Interactive Mathematics Students Are More Successful than Their Peers in Traditionally Taught Courses, According to a Recent Study by the College



Overview—Berea College, Berea, Kentucky

- Berea students enrolled in Interactive Mathematics attended class more regularly and were more engaged in the coursework during class time.
- They began work more promptly, used class time more productively, and more often left class with a feeling of accomplishment.
- Students seemed to be better prepared for tests. In general, there was less need for retakes.

At Berea College, courses in Basic Math (a prealgebra course plus an elementary/intermediate algebra sequence) are required of all students who do not waive them. The Basic Math instructional team agreed that the key to student success in these courses is motivation, which can be measured as regular class attendance, good preparation for tests, good progress through the course, and a feeling of satisfaction about the course.

The study, therefore, used these criteria to measure student motivation in Basic Math courses using Interactive Mathematics (formerly an Academic Systems program) versus the same courses taught using the textbook *Developmental Mathematics*, by Bittinger and Beecher (5th ed., Addison-Wesley). Fifty-nine students were enrolled in textbook sections, and 44 students used Interactive Mathematics. Assignment to sections was random and all courses used a time-flexible, independently paced approach.

Statistically significant differences were noted between the two formats on most measures, and in every case the difference favored the computer-mediated format. Students using Interactive Mathematics courseware, now part of PLATO Learning, attended class more regularly, completed the course at higher rates, demonstrated better preparation for tests, and exhibited a slightly more positive attitude toward the course.

“The results confirmed what we had hypothesized: Interactive Mathematics enhanced learning and improved teaching by increasing student motivation and assisting in the organization and maintenance of individual student records,” said Patty Boyce, emerita, Basic Mathematics Program at Berea and the study’s co-leader, along with Judith Weckman, director of the Office of Institutional Research and Assessment.

“We found students in Interactive Mathematics courses to have fewer absences, fewer test retakes, higher course completion rates, and higher rates of course satisfaction,” Boyce said. “Because of these positive results, we increased the use of Interactive Mathematics in Basic Math classes at

INSTITUTION: Berea College, with roots dating back to 1855, takes a unique approach to higher education. The college provides every student a full-tuition scholarship, admits only low-income students, and requires all students to work in a college job. Berea is ranked as a top teaching institution in the South. *US News & World Report* magazine named Berea the top liberal arts college in the South for the 7th time in its 14th annual ranking of America’s best colleges.

SIZE: Berea College enrolls about 1,500 students per term, from over 65 countries. Nearly 75 percent of students are from southern Appalachia.

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“Interactive Mathematics enhanced learning and improved teaching by increasing student motivation.”

PATTY BOYCE, EMERITA,
BASIC MATHEMATICS PROGRAM

Berea College and hope to offer more students this approach to increase their success.”

Class Attendance

Data related to class attendance in Basic Math revealed that students in the computer sections attended class more regularly than students in the textbook sections.

In the instructors’ experience, students who missed class often (i.e., more than six times during the term) were apt to lose touch with the instructor and the material, interrupt the continuity of their work, and experience more difficulty learning.

The results of the math department’s study showed that 74 percent of computer students missed class no more than three times during the term, compared with 42 percent of textbook students. Only 12 percent of the computer group missed class more than six times, but 38 percent of their counterparts in the textbook group accumulated more than six absences. The average (mean) number of absences in the textbook sections was 7.66 versus 2.84 in the computer sections.

Test Retakes

Students in both formats were given similar paper-and-pencil tests covering each topic. Students in the textbook sections generally required more retakes than students in the computer sections—approximately 20 percent more tests were retaken in the textbook section than in the computer section.

Course Completion Rates

At the beginning of fall term 2000, each student in the study was enrolled in one of two courses: Prealgebra (MAT 010) or Algebra (MAT 011). Results showed 89 percent of students in the computer sections and 73 percent of students in the textbook sections completed the course for which they were registered.

Student Satisfaction

Student satisfaction with the course was measured using two questionnaires

administered together near the end of the term. The difference between the two groups with regard to attitude was less obvious; no statistical significance was apparent on this measure. However, students using Interactive Mathematics exhibited a slightly more positive attitude toward the course.

Results

- Seventy-nine percent of students in the Interactive Mathematics sections rated the course excellent or very good.
- Fifty-six percent of students in the textbook sections rated the course excellent or very good.
- Seventy-five percent of students in the Interactive Mathematics sections rated their overall satisfaction with the course as excellent or good.
- Sixty-four percent of students in the textbook sections rated their overall satisfaction with the course as excellent or good.
- Faculty feedback was overwhelmingly positive.

Instructors report that the multimedia format of Interactive Mathematics has been a positive motivational factor for many students and that the record-keeping features of the program assist in the organization and maintenance of individual student records. Additionally, the quality and variety of explanations provided through the software for mathematical ideas is “impressive” and aids in student success.

“The assumption here was that motivation will generally lead to success, especially in the case of developmental students,” Boyce said. “This study provides some of the clearest results to date in favor of Interactive Mathematics versus traditional teaching for developmental math.”

“This study provides some of the clearest results to date in favor of Interactive Mathematics.”

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