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Enhanced WebAssign® Proves Integral to Teaching and Learning Calculus

Sholeh Shariat has taught mathematics for 15 years at Gaston College in Dallas, North Carolina. The community college enrolls more than 5,000 students each term in its curriculum programs and averages 16,000 students annually in its continuing education programs. In any given term, Sholeh's teaching "plate" is likely to have courses ranging from survey of mathematics to pre-calculus algebra to calculus. When she teaches any course in the calculus series, she uses Enhanced WebAssign® (EWA) for online homework. "EWA is an excellent tool that allows students to get one-on-one instruction, 24 hours a day, outside of the classroom," she says. "It helps them learn calculus concepts and consequently do better in the course."

COURSES AND PARTICIPANTS

Most of the students in Sholeh's calculus courses, which are taught face-to-face, take calculus as a requirement for an associate's degree and will go on to earn a baccalaureate degree in engineering or the sciences. They are adept at mathematics, and almost all of them are non-traditional learners who are carrying a full college load while working to support themselves and their families.

Sholeh began using Enhanced WebAssign two years ago when it was offered as a complement to her Cengage Learning textbook, Larson and Edwards' *Calculus*. Based on her initial experience and positive feedback from students, she has been using it regularly in calculus ever since.

THE CHALLENGES

Although Sholeh's students are motivated learners with strong mathematics backgrounds, their other responsibilities make it difficult for them to find time to do assignments. "We try to provide them with many resources outside of the classroom so that they have every possible opportunity to succeed in the course despite their time limitations," she says.

In addition, succeeding in calculus requires a jump in course work that can be a shock. "Students learn a vast amount of complicated new material in calculus, requiring them to work harder than ever before to grasp and retain it all," says Sholeh. "Consequently, some students need more one-on-one instruction and extra practice than I can provide in class — but often have no time to come to campus and seek tutoring. That's why any resource that helps them practice, learn concepts, and do well on the tests is valuable to us."

Sholeh's key focus is on making sure that students achieve course objectives. "In addition to wanting students to learn main concepts, we want them to learn how to become good problem solvers — to be able to look at provided information and then figure out how to approach the problem in a way that will lead to the correct answer," she says. "Such skills will serve students well in math and in their chosen careers, but promoting that level of proficiency takes considerable time for both instructors and learners."



CHALLENGES

- **Instructors want to help their calculus students develop sound problem-solving skills** that will serve them throughout their careers.
- **Calculus students, even motivated ones, need extra practice and one-on-one tutoring** outside of class to grasp the formidable amount of complex new material presented in the course.
- **Performance can suffer among non-traditional students** who have family and work responsibilities, and little time for homework.

SOLUTIONS

- Enhanced WebAssign®
- Larson, Ron & Bruce H. Edwards, *Calculus*

RESULTS

- **EWA provides students with virtually unlimited practice opportunities**, as well as guidance that walks them step-by-step through the problem-solving process.
- **Students get individual attention outside of class** because online homework problems (pulled from the textbook) are enhanced with links to eBook pages, worked examples, videos, and other tutorial guidance. Immediate feedback on incorrect answers encourages students to continue practicing, thereby reinforcing learning and retention.
- **Grades of students who used EWA were higher** than for those who didn't use it. 24/7 availability on multiple platforms allows busy students to work at their convenience on desktops, laptops, and tablets.

“We use EWA because we all have seen improvement in students’ understanding and grades... There’s a definite correlation between using Enhanced WebAssign and getting better grades.”

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THE RESULTS

Available around the clock, EWA accommodates students’ busy schedules, allowing them to work at their convenience on a computer, laptop, or tablet. Assignments include problems that are pulled directly from the text, and then enhanced with interactive tutorial resources. “Enhanced WebAssign is very helpful for students who need extra practice outside the class,” says Sholeh. “If they have difficulty with a certain topic, they have access to many resources such as worked examples, practice problems, and video tutorials that lead them to deeper understanding.” In addition, EWA includes access to an eBook; students can link to relevant selections by clicking a “Read It” button included for every problem.

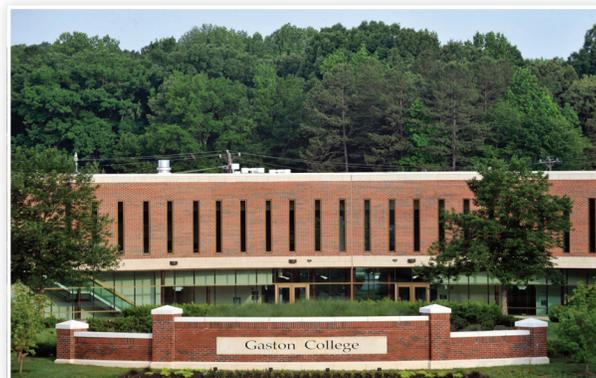
Enhanced WebAssign also addresses Sholeh’s goal of helping students become better problem solvers. She provides guidance and examples in class, and EWA provides students with the critical practice and support they need outside of class to build their skills. “EWA is the next best thing to a tutor for providing one-on-one instruction. It points out the logical process for working through each problem and arriving at the correct answer, and offers guidance when students answer incorrectly,” she says. Sholeh believes that EWA is particularly beneficial in calculus courses, and hasn’t found any other online solution that matches its capabilities or effectiveness.

Overall engagement and comprehension have improved with EWA, leading to better student outcomes. Says Sholeh, “We use EWA because we all have seen improvement in students’ understanding and grades. Students who miss the assignments see their grades drop, and the students who do the EWA assignments perform well. There’s a definite correlation between using Enhanced WebAssign and getting better grades.”

EWA grades assignments automatically and provides students with feedback that supplements Sholeh’s own comments and pointers, considerably reducing her workload. In addition, she is very satisfied with EWA technical support. “Enhanced WebAssign is getting better all the time,” says Sholeh. “It also offers good technical services. Any time I have a problem with something I can get in touch with them and they take care of it.”

“Enhanced WebAssign has been good for my reputation as an instructor, both because it is an excellent resource that allows students to get help outside of class, which they appreciate, and because it helps students perform well in my courses, which I appreciate. EWA helps all of us, students and teachers alike, be more successful.”

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