

Javier Garza

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Enhanced WebAssign® Increases Homework Completion Rates and Boosts Student Confidence in their Math Abilities

Professor Javier Garza has been a member of the mathematics department at Tarleton State University in Stephenville for 19 years — serving seven years as department head before stepping down to return to his first love, teaching. While in graduate school working on his master's degree and doctorate, he taught an additional seven years, for an impressive total of 26 years of college-level teaching experience.

Javier has used Enhanced WebAssign® (EWA) in his Calculus I and Calculus II classes over the past three years and was initially attracted to this online homework solution because it allowed him to quickly connect with his students around their performance on homework assignments. “I had used another online solution in a trigonometry course, but when I heard about Enhanced WebAssign and what it could do, I was enthusiastic about jumping in. As with other online homework systems, I liked the prompt feedback it could give my students and the ease of grading; but more so, I appreciate that EWA provides good dynamic content that allows students to engage in discovery/exploratory activities that encourage richer conceptual mastery. Additionally, some questions are presented in subparts to assist students in progressing towards mastery of multistep problem solving.”

COURSES AND PARTICIPANTS

Typically, Javier's students are recent high school graduates, though very few of them take his classes as part of a general education curriculum. He notes that sections of Calculus I are filled with engineering, mathematics, and pre-med majors, as well as honors program students. Calculus II, on the other hand, tends to attract students in more math-oriented scientific disciplines such as engineering, mathematics, physics and computer science.

Regardless of the class he is teaching, Javier assigns homework at each session. He is currently using a hybrid approach that blends EWA with paper-based homework. In selecting EWA assignments, Javier chooses questions very carefully. “I try to pick problems that have a lot of dynamic, visually oriented content like links to videos, tutorials, and pages in the Stewart textbook that I use. The written homework can't give my students that.” Javier also likes EWA problems that break a complex operation into intermediate steps and walk students through them in logical sequence. “Enhanced WebAssign has a lot of great features,” he says, “and I am working to take full advantage of the technology it provides.”

THE CHALLENGES

During his years of teaching calculus and other math courses, Javier has developed insights into the challenges he and his students face. As he sees it, instructors typically struggle to impart key concepts to their students and to budget the time necessary to help them arrive at a solid understanding of difficult material.

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CHALLENGES

- **Instructors often struggle** to find the time necessary to help students understand complex course material.
- **Students may be reluctant to attempt homework assignments** because they do not believe they will be successful.
- **A poor conceptual foundation and “by rote” learning** makes both instructors' and students' tasks more difficult.

SOLUTIONS

- Enhanced WebAssign®
- Stewart, *Single Variable Calculus: Early Transcendentals*, Seventh Edition

RESULTS

- **Dynamic content, including EWA features such as animations, videos, and step-by-step problem solution**, have improved comprehension, boosting students' confidence in their ability to perform successfully.
- **Homework completion rates** have increased, indicating that students are more engaged in their coursework and significantly more likely to pass.

“What I want is to transform students into independent learners and thinkers. That transformation all starts with helping them to be successful with homework.”

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Interestingly, he does not believe that understanding the concepts underlying calculus is the most important issue his student grapple with. Homework looms larger. “The greatest challenge I have is getting my students to do the daily work,” he says. “The problem is not that they are lazy. What they tell me is that they attempt the homework but it is ‘so darn hard,’ and they don’t believe they will be successful.”

Another of his concerns is that students may arrive in his classes with a poor understanding of other mathematical disciplines such as algebra. “They’ve passed classes by learning how to do certain problems, but they don’t really understand the material. With the technology it brings to bear on homework, Enhanced WebAssign can help them develop a better understanding and move ahead.”

THE RESULTS

Javier believes his use of EWA has had a “significant” effect on comprehension — and grades — with students more confident than before that they can perform on homework and tests. “My students tell me that the step-by-step, ‘ramp-up’ examples in Enhanced WebAssign help them get their legs under them, so to speak.”

Homework completion rates have improved, and Javier sees evidence of greater student engagement, a goal he and his fellow instructors strive for. As he puts it, “If you talk to most faculty, they are optimistic about a higher percentage of pass rates if students are doing the homework assigned. Homework is really everything, and we all think they need to be working outside of class.”

Given his ambitious teaching goals, Javier feels that he can do even more with EWA. His students like the eBook version of the Stewart calculus text, and he plans to use Cengage YouBook capabilities to enrich the text with animations, web links, YouTube videos, notes and highlights, and narrative enrichments to more effectively capture their attention and smooth the learning process.

“What I want,” he says, “is to transform students into independent learners and thinkers. That transformation all starts with helping them to be successful with homework.”

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