

Changing the Equation: Observed Best Practices

In 2007, the typical community college had a 38 percent success rate in Introductory Algebra. (Other developmental math courses didn't fare much better.) Statistics showed that within three years of first taking the course, only 28 percent of students went on to a college-level math course. Of those 28 percent, only 20 percent passed the course on the first try. Faculty, administration, and even students agree: those numbers are not acceptable.

The National Center for Academic Transformation (NCAT), a pioneer in driving positive change in higher education, is helping do something about it.

Program Overview

The NCAT is an independent, nonprofit organization whose research-based methodology has produced quantifiable results in learning gains, retention, and cost savings since 1999. In support of its mission, the NCAT led the Changing the Equation (CTE) grant program from September 2009 to September 2012. Funded by the Bill & Melinda Gates Foundation, the program was specifically designed to engage U.S. community colleges in successful redesigns of their remedial and developmental math sequences.

A nationwide competition resulted in the program's acceptance of 38 college participants, collectively representing 114 individual mathematics courses, 4,531 sections, and more than 100,000 students. Each participant redesigned its developmental math sequence using the NCAT's Emporium Model plus either MyMathLab or another commercially available instructional software. In addition, each participant modularized its curriculum, thereby enabling students to progress faster or slower through the course sequence according to their needs.

Results from this visionary study were just as NCAT predicted: 32 of the 38 institutions implemented the requirements and experienced improvement in one or more categories. **Of those 32 institutions, 25 (78 percent) used Pearson's MyMathLab.**

The results¹ achieved by those colleges that used either MyMathLab or MyLabPlus are particularly worthy of note, especially considering the program's accelerated time frame. Pearson detailed these outcomes in *16 Proven Ways to Help Your Course Redesign Succeed*.² Excerpted here, from the original white paper, are the top eight best practices used by the program's most successful institutions. Most important, each best practice can be implemented beyond the scope of the original CTE program and to *all* institutions—whether two-year, four-year, or private—and across the full spectrum of math courses.



“If institutions follow our advice... we guarantee that they will improve student learning, increase completion of the developmental math sequence, prepare students to succeed in college-level math, and reduce instructional costs.”³

—Carol Twigg
President and CEO, NCAT
At the onset of the CTE Grant Program

¹ www.thencat.org/Mathematics/CTE/CTE_Lessons.html

² www.pearsonmylabandmastering.com/northamerica/results/files/Math_courseredesign_WP_Mar2013-24.pdf

³ <http://dx.doi.org/10.1080/00091383.2013.806169>

I. Conduct a pilot implementation before embarking on a full-scale rollout.

Without exception, every successful project had conducted a redesign pilot in a small number of course sections before conducting a full-scale implementation of its course redesign. After one or two semesters, initial problems got worked out, and the institution was able to smoothly scale its redesign to all course sections.

Robeson Community College

During the pilot phase, parallel sections were used to assess student learning. Data obtained from the pilot phase compared student success rates and retention rates between the traditional and the redesigned model. Indirect measures of student success were obtained through student surveys.

www.thencat.org/Mathematics/CTE/Abstracts/RCC_Abstract.html

2. Train adjuncts, tutors, and other key players—and keep training them.

Consistency is vital to the success of a MyMathLab implementation. Pearson provides product and implementation training to ensure that each implementation is in alignment with the institution's stated goals. Once an implementation is up and running, weekly meetings and the mentoring of part-time faculty, adjuncts, and tutors can help keep all players connected and on board.

Volunteer State Community College

VSCC has moved from a culture of traditional face-to-face lecture to a culture of student-centered, faculty-supported, technologically-based learning. The departmental professional development calendar includes specific ongoing training for emporium faculty and staff.

www.thencat.org/Mathematics/CTE/Abstracts/VSCC_Abstract.html

Northwest-Shoals Community College

NWSCC has greatly appreciated the input and support from the College's NCAT Scholar, John Squires. He served as a mentor, solutions expert, and friend. The NCAT workshops allowed the College to interact with other institutions that faced the same challenges. This gave a sense of community among the colleges so that no one felt the sting of isolation throughout the process.

www.thencat.org/Mathematics/CTE/Abstracts/NWSCC_Abstract.html

What is course redesign?

Course redesign is a data-driven innovation intended to increase quality and improve efficiency in large-enrollment introductory courses. When combined with high-quality teaching and learning courseware like MyMathLab and other MyLab products, institutions that redesign their courses achieve more-effective use of instructor time, increase student time on task and engagement in course material, and reduce institutional—and, frequently, student—costs.

3. Position your students for success.

When it comes to positioning students for success, no one has more experience than Pearson Faculty Advisors. When those advisors were asked about their own experiences and those of faculty at schools they've helped, two themes rang out loud and clear:

- **Conduct a first-day-of-class orientation.** Pearson's customized getting-started presentations, handouts, and email templates help students understand the value of course materials and the connection between learning the course objectives and successful completion of the course. Visit firstdayofclass.com for more information.
- **Provide structure.** The more structure you build into your implementation, the more success students will have. This includes the presentation of clear expectations and the setting of firm and consistent deadlines.

Northwest-Shoals Community College

[T]he first-day orientation class served as one of the most important days for student understanding of the program.

www.thencat.org/Mathematics/CTE/Abstracts/NWSCC_Abstract.html

4. Require both attendance and completion of assignments for credit.

What most faculty have already observed, the CTE project confirmed: required attendance is critical to the success of both your redesign and your students. Twigg underscores the point in the project's full report. "It was absolutely necessary to have an incentive for attending class and/or a penalty for not attending. Similarly, assignments must be required. Math faculty and tutorial staff quickly realized that students don't do optional."

Oakton Community College

Required attendance in class provides a common grade component throughout the department and helps students identify milestones in course progress that indicate success.

www.thencat.org/Mathematics/CTE/Abstracts/OCC_Abstract.html

5. Employ personalized learning.

The most successful solutions include personalization and immediate feedback that engage students in active learning and that enhance and inform assessment. Students who use MyMathLab are able to complete assessments at their own speed and, via diagnostics performed along the way, can follow a personalized learning path that both targets the exact skills they need to work on and delivers the right material they need to master those skills.

Guilford Technical Community College

The guided module design allowed students to be more active and engaged learners, receive immediate feedback about their work, focus on what they did not know and move quickly through what they did know. A combination of guided content learning, acceleration and remediation as needed meant that more students could successfully complete the course and that the cumulative learning effect from module to module would be greater because the mastery approach was reinforced with regular testing.

www.thencat.org/Mathematics/CTE/Abstracts/GTCC_Abstract.html

Student engagement

Pearson's Faculty Advisors recommend the following techniques to promote student engagement.

- Offer points for everything! They won't do the work if it doesn't count!
- Offer self-acceleration options.
- Have students respond to one another by offering them points for responding and sharing ideas.
- Get information to students as early as possible.
- Remind students that *they* are the ones accountable for their grades. Add the following to your signature line: "Remember: YOU determine your grade."



Subsequent success rates

Some CTE institutions had sufficient longitudinal data to compare how well students who complete the redesigned sequences perform in subsequent college-level courses with those who entered via the traditional format.

At Northern Virginia Community College, the success rate in Math for Liberal Arts for all students was 67.7%; for students who had completed the redesigned developmental math course, the success rate was 72.5%.

The success rate in Precalculus for all students was 57.7%; for students who had completed the redesigned developmental math course, the success rate was 72.0%.

At Northwest-Shoals Community College, the percentage of developmental math students successfully completing a college-level math course increased from 42% before the redesign to 76% after the redesign.

At Pearl River Community College, final exam rates in college-level College Algebra increased from a mean of 64.4% in the traditional format to 73.8% after the redesign.

Completion rates in College Algebra went from 59% prior to the redesign to 76% after the redesign.

6. Conduct frequent assessments.

Instructors have long recognized the necessity of assessment as both a measurement of how well students are learning and a tool for critical feedback. A successful MyMathLab implementation increases the power of assessment by increasing the number of assessments, thereby offering students a firsthand account of what they know and what they don't, and by providing instructors more opportunities to intervene before a student falls too far behind.

Pearl River Community College

The redesigned courses 1) had more assignments, more quizzes, and more tests than the traditional courses, 2) included more content than the traditional courses and consequently took longer to finish, and 3) required an 80% mastery level that raised the cut score to earn a C. Overall, redesigned course content was more rigorous to better prepare students for college-level math courses. The math department chair and several instructors have noticed that students who have completed the redesigned developmental math sequence are better prepared and their knowledge base is more consistent.

www.thencat.org/Mathematics/CTE/Abstracts/PRCC_Abstract.html

7. Require mastery learning.

Students who advance without full competence in skills are doomed to struggle—if not fail. Mastery learning ensures that skills are solidly understood and that they build one upon another, thereby reinforcing previous knowledge and increasing confidence throughout the course sequence. In addition, implementations that employ mastery learning invariably find that students both complete more work and learn more than do students in traditional formats.

8. Track learning gains.

What isn't tracked can't be measured. And what hasn't been measured can't be proven. School faculty who consistently track and measure learning gains are able to make informed decisions about programmatic shifts and can increase their abilities to prove institutional effectiveness, meet accreditation standards, track quality-enhancement plans, and fulfill grant requirements. Pertinent metrics include comparisons of homework grades, exam scores, and final grades with those of past semesters; correlation between time spent and final grades; subsequent success rates; retention rates; and the effectiveness of using the text in tandem with the online product.

Guilford Technical Community College

GTCC is deeply committed to research-based decision-making. GTCC evaluated the effects of the redesign by comparing performance on a common final exam in the traditional and redesign sections. GTCC also looked at comparative success rates as well as persistence and retention rates in the developmental courses.

www.thencat.org/Mathematics/CTE/Abstracts/GTCC_Abstract.html

Contact Pearson at pearsoncourseredesign@pearson.com with any questions. For more details on the CTE program, visit “Improving Learning and Reducing Costs: Project Outcomes from Changing the Equation”⁴ For more case studies using MyMathLab products, see the Pearson Results Library⁵.

Pearson's Faculty Advisor Network (FAN) helps instructors improve the teaching and learning experiences at their institutions—it is where educators go to meet and engage with a community of their colleagues eager to share advice, tips, and best practices related to MyLab products. Join the network at <http://community.pearson.com/fan>.

⁴ www.thencat.org/Mathematics/CTE/CTE%20Lessons%20Learned.pdf

⁵ pearsonmylabandmastering.com/results