

Using Research-Based Decisions to Guide Your Program

Donna McKusick, Ed.D
Senior Director for Developmental Education
The Community College of Baltimore County

Talk delivered on November 18th 2006, at the Achieving the Dream Student Success Institute Math Roundtable

Good morning. I am honored to speak with you as a fellow worker in the fields. I have been involved in developmental education for over 30 years and have directed the developmental education program of the Community College of Baltimore County for over 7 years.

And perhaps the most valuable thing I have learned in those seven years is to let the data speak, let them answer the questions we always ask: Does this promote learning? How do we know?

In the next few minutes, I am going to take you on a fast road trip that leads to a successful program with seven stops—rest, gas up, get directions—decision points, if you may, to illustrate how CCBC has used the two questions—does it promote learning and how do we know—on a day to basis to answer questions and to solve problems.

First, as we started this trip, we needed to know where we were going. We chose as one very important indicator of success the goal to increase pass rates in developmental courses, because we knew from the Exxon Research in the late 90's by Hunter Boylan and from other studies that students who pass developmental coursework go on to pass credit courses and to be retained at rates that are often higher than those rates of non-developmental students.

But students can't complete courses if they never get into them.

Decision Point 1: Who Should Have Their Skills Assessed?

About eight years ago, our assessment policy had a major hole: Students who declared themselves upon entry as non-matriculating, personal enrichment students (often on the advice from math-phobic advisors) were exempt from assessment. Anecdotal evidence told us that students were using this system to avoid assessment. They would begin their coursework and then change their status. So did it promote learning? How did we know?

We decided to investigate the GPAs of these non-matriculating students as compared with other students, and found a bi-modal distribution—one set of students who were probably genuinely non-matriculating and who had often already completed some college, and another set with a mean GPA that hovered around 1.0. Our decision was to get rid of this exemption. We now have other ways for students who have already successfully completed credit courses to be exempt from the policy.

Decision Point 2: When Should Students Enroll in Developmental Math Courses?

Math faculty were reporting that they had students who weren't starting their developmental coursework until their 4, 5, or 6th semesters. We had no policy on this. To research this, I examined a sample of transcripts of students in 18 out of 49 sections who registered for MATH 081 in the fall of 2001 and followed them up to the present. In those 18 sections, I found 24 students who had skipped semesters in completing their math sequence. None of them had graduated, but 4 were within 10 credits. Of those 4, 3 would need at least 2 more semesters to complete developmental math and general education math. We can extrapolate from this data that many students are in the situation of not being able to graduate because they have delayed their developmental math. This evidence was enough to persuade our Senate to pass a continuous enrollment policy, stating that students must begin their developmental coursework when they enter and continue enrolling until completion.

Decision Point 3: Which Courses Should Students Enroll In?

Which courses should developmental students enroll in? I am just going to speak about math. We had in place a three course system. Our research showed that students who passed developmental courses were as likely as or more likely to pass credit math courses or to be retained than non-developmental students. Our pass rates were not meeting the 60% benchmark that we strive for. (We established this by examining the pass rates across the country in developmental courses using PEQIS data from the National Center for Education Statistics.)

We decided to analyze the pass rates against the cut scores, using intervals of scores within each course. We believed that our strategies, although not perfect, should insure that a student has at least 50% chance to pass the course. The analysis told us whether a student had a 50% chance (our own criteria) of passing a given developmental math course at a given cut-score level. By looking at this data graphically, we instantly understood where our cut scores were off. Of course we used other data as well, looking at cut scores across the state and the country. Did it improve learning? Yes. How did we know? Our pass rates in developmental math began to climb. Now, we need to revisit the crucial test of how students pass developmental coursework do in their credit courses.

Decision Point 4: How Should Developmental Math Courses Be Delivered?

How should the courses be delivered? For this we went straight to a body of research posted on the website of The National Center for Developmental Education, entitled *Thirty Years of Research in Developmental Education* by Boylan and Saxon—and we found that using a variety of delivery systems is the best pedagogy, to address all of the different learning styles of our learners. So we have self-paced, lecture-discussion, distance, learning communities, and other systems.

Do some of these delivery systems work better with some students? Absolutely! Once campus that primarily uses a lecture/discussion has achieved a 60% pass rate for all students in the bottom level course. But as we have delved further into the research, we have discovered that no matter what the delivery system, we want it to do the following: offer structure (Smittle), offer opportunities for affiliation (Tinto), offer opportunities for

practice (brain-base learning, Smilkstein) and increased time on task. It is now our task to begin to examine the effectiveness of each delivery system with students are varying characteristics, age, gender, and race.

Decision Point 5: How should developmental math students be supported?

Here we learned our lessons from a variety of sources. We had already begun to address the non-cognitive needs of our developmental reading students with a required 3 credit course on student success. We selected reading by examining the work of Clifford Adelman of the US Department of Education who determined that students placed in developmental reading had a lower chance of long term success.

At any rate, once the students were in this three credit course (2000 of them a year) we stole a trick from Valencia's research that showed that developmental students who passed their developmental coursework, passed 12 credit hours, and had a plan had an inordinately high probability of graduating. From this we created our web-based graduated learning plans. Our own research on approximately 650 students who completed these plans as compared to 590 students in the same course who did not complete plans shows a 17% increase in first semester retention, and a GPA that was an entire point above those who did not complete the plans (2.5 compared to 1.5). Now we have begun to have our developmental math students create plans, and we may push for requiring the student success course on the developmental math students as well, depending on our research.

Decision Point 6: How should developmental math students be graded?

Our math faculty had long complained that some students lost motivation when their only requirement was to achieve minimal mastery to receive a passing grade. Our question was, "would our developmental math students be more motivated if we gave them letter grades with points that worked into GPAs?" We turned to a study that Hunter Boylan did of remediation in Texas as well as our fellow Vanguard colleges to answer this one. The answer seemed to be overwhelmingly, yes, grades motivate. So we switched to a letter grade system that includes no Ds. And we did see a small, one time increase in pass rates (about 3%). Now we need to research whether successful developmental math students who get C's perform as well in credit math courses as those who get A's and B's.

Decision Point 7: How should we transition students to credit math courses?

Again, we turned to national research and discovered Supplemental Instruction (out of University of Missouri Kansas City) to be an excellent service to offer students in introductory math credit courses. We like SI because it offers something that comes out of the K-12 body literature on learning and cognition—explicit instruction in skills transfer. From this research, we know that that students do not automatically know how to transfer the ability to do a specific kind of math problem from their developmental math course to their chemistry course or their credit math course. They need to be taught when and how to transfer or use what they have learned in other contexts, and they need extended practice in doing this. Our follow-up research on SI in general thus far shows great successes in Biology, but minimal success in developmental math. We probably need to customize our delivery of supplemental instruction for developmental courses.

In summary, we have used research at all levels to guide our basic program decisions. In the past five years, we have slowly increased the pass rates for both African American and white students in our developmental math courses and other courses while reducing achievement gaps. I want to point out several things.

- First, how little of the research we have used is about mathematics... this is for you to discuss with the math guru. A large part of this work is about setting up environments that foster learning.
- Second, we are now resetting one of our goals, recognizing that course pass rates, even sequence pass rates are not enough, because of the body of research coming nationally and from our own shop about the large number of students who complete remediation and never go on to take credit courses. We are also recognizing that we need to gather data on student purposes for attending to better be able to interpret this new, disturbing data.
- The third point is that no one research-based decision has solved all of our problems. Our progress is the result of many little steps. There is no one magic bullet.
- And most important, you can use data and research to help you make important decisions about your program.