GUEST WRITER

A + B = STCC: Mathematics from a Community College View

By Dr. John B. Cook, President, Springfield Technical Community College

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It is a simple question, but one that can inspire a range of emotions: how do you feel about math? Right up there with "what do you want to be," another topic that shapes the thinking of a given college student is how they view mathematics. When it comes to ability, some students work to avoid math for as long as possible, and many alumni will offer a wry smile as they recount their survival in that required math course. Too many students unfortunately, and graduates alike, have a belief that their math ability is fixed, as opposed to viewing math as a skill, like learning a language. Truth be told, we know that not all "math" is the same, and importantly, we also know that math understanding and application can very much be developed.

In a given career, the need for a particular math skill will vary, be it understanding of Geometry, Algebra, Trigonometry, or Calculus. Goodness, I know for some that just reading words like Trigonometry generates a cold sweat. If it helps, I have had my own struggles with math, and was a high school and college student who never progressed beyond Pre-Calculus. Yet all told, between undergraduate and graduate studies, I have taken five Statistics, or Statistics-involved courses. Starting in high school, and carrying through my graduate studies, I realized this type of math, statistics, and this approach to analyzing, interpreting, and presenting information, carried a deep interest for me, and was also a skill I learned to develop.

Here is a remarkable statistic to consider: in fiscal year 2017, Springfield Technical Community College offered 290 "sections" of mathematics. Essentially this means we offer a tremendous amount of math in a given year. One other helpful statistic: the average class size in these 290 courses at STCC was just 17 students. For a given student anxious about math, I am thrilled they can work through this subject in a small class, and with a caring STCC professor who will provide individual attention.

Of all the math that we offer at the college, there is one aspect that remains a persistent challenge for us. To start, yes, some STCC students do enjoy Calculus, and in the Fall of 2017, we had 11 math majors, and another 66 Pre-Med/Vet/Dental students all taking Calculus. But much of the math we teach is what we call "developmental." STCC is obligated by the Department of Higher Education to assess the skills of all incoming students to the college. One element of this testing is an assessment of math skills, and many students will test into a course that is not college-level; so "developmental" math means students will take Pre-Algebra, Algebra I, or Algebra II. The idea is that we want to help build up their math foundation, but we also know this means the time it takes a student to pass through her or his developmental sequence can add time to their program. Candidly, many students at STCC who placed

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below college-level had not yet attempted a college-level math course after three years. This is a serious concern for all of our staff, faculty, and administration. To once again illustrate my point through a statistic: of the 1,695 students we looked at from our 2014 cohort, 1,202 (71%) placed into a developmental math course. The key therefore, for our students, and for us as an open-access college, is persistence. How do we help students stay with college; how do we help them transfer to a Bachelor's institution; and how do we help them graduate?

To offer some aspiration, there is a wonderful outcome we find for students who arrive at STCC and do not place into any form of developmental reading, writing or mathematics. For the years we studied, 73% of "ready/ready" students have on average, graduated, transferred, or are still enrolled. This is a remarkable statistic. To show some sense however, of the need for persistence, for the many "nearly/ready" students who do need some developmental work, the persistence rate of graduated/transferred/still enrolled, dips below 50%.

Furthermore, we are also quite open-eyed about disparities found by ethnicity within our data. In reviewing our statistics for 2004 – 2011, we see that on average, the overall persistence rate for white students is 57%, and yet it is 42% for African-American students, and 38% for students who are Latina/Latino. If you are wondering what the college is doing to address these inequities, please know those efforts are very much on the minds of us all at STCC. To be sure, we are intervening, and are not shy about acknowledging that work with students of color is imperative, and addressing needs will be essential. We also know that one single approach will not solve these persistent and stubborn challenges, so we utilize peer/student supports in various classes, and we have also piloted "co-requisite" models where students take developmental courses at the same time as courses that count toward their degree.

These are just two examples, and no community college quite frankly, has solved these challenges. To the point about the importance of math, we need to continue measuring to see if, how, and why our interventions are working. To help the thousands of students taking math each year at STCC, we will need collaboration from all of our faculty, staff, and administrators, and I don't believe we need Calculus to capture the importance of this change in our approach. Mathematics from a community college view is not overly complicated, but like our students, it needs our resolve and our persistence.