Mc Graw Hill ALEKS®

**Case Study** Columbus State Community College

# SEEKING EDUCATIONAL EQUITY THROUGH REDESIGN INITIATIVES

# BRIANNA SWAIN'S MATH SUCCESS STORY

Brianna Swain is a confident African-American woman and a graduate of Columbus State Community College. She is now a student at The Ohio State University, majoring in math. Brianna's future is bright, but her path to success was neither simple nor expected.

Brianna grew up in a lower-income neighborhood in Columbus, Ohio, where per capita income was nearly half of the state-wide median. In middle school, she was suddenly uprooted when her family was forced to move in with her aunt in a different school district. This became a tipping point in Brianna's life.

It was there, in a strong high school, that Brianna discovered she was far behind her peers in school. "Everyone around me was so much better prepared, academically," she recalls. "I couldn't even write an essay." While some students would've given up or been demoralized, Brianna was motivated to work even harder.

## Facing Educational Inequities

Brianna's story demonstrates how educational inequity manifests itself in America's underserved and lower socioeconomic neighborhoods and cities. It also shows that students, even self-starters like Brianna, who can recognize their talents and abilities, can spend many of their critical educational years completely unaware that they are falling behind. More importantly, Brianna's story provides a window into the types of academic intervention that help students like her—interventions like college transition programs,

**BRIANNA'S STORY PROVIDES A WINDOW INTO THE TYPES OF ACADEMIC INTERVENTION THAT HELP STUDENTS LIKE HER.**

opportunities to accelerate through developmental math and improve the odds of graduating, before college and in the fragile first year of college.

Today, when Brianna thinks about the future, she says she wants to raise a family “in a safe neighborhood with good schools,” and to be a math tutor at TRIO, so that she can help students just like her realize that anything is possible if you are willing to work hard.

How did things go so well for Brianna Swain? The answer lies in Brianna’s own persistence and determination combined with the levels of institutional intervention that guided Brianna toward achieving her dreams.

# BRIANNA'S KEYS TO SUCCESS

## Success Initiative 1: College Readiness

In middle school, Brianna connected with Columbus State's TRIO Educational Talent Search, a program funded by the Department of Education that targeted underserved schools. Along with her classmates in the program, she visited a few college campuses to learn about what was possible beyond high school—as a college student and as a career-oriented graduate. Brianna was not able to be as active in the group after moving out of Columbus, but her advisor kept in touch and encouraged her to enroll in college after graduation. Brianna still recalls the impact of those first meetings with Columbus State's TRIO Student Support Services. "They helped me so much," she says.

## Success Initiative 2: Course Placement

The first college-level initiative for Brianna was her math placement. Knowing her ACT score was not going to place her into credit-level math, she took the ALEKS PPL placement assessment. But Brianna was not satisfied with her first score, which placed her in Intermediate Algebra. She spent nine hours reviewing math skills in the personalized Prep and Learning modules, retested, and placed on the cusp of College Algebra placement cut scores. Partnering with her TRIO Student Support Services advisor and the math department, she enrolled in the College Algebra corequisite pilot. With the department's commitment to accurate placement and giving students an opportunity to review and refresh, Brianna was placed in a course where she could be successful.

## Success Initiative 3: Accelerated Corequisite

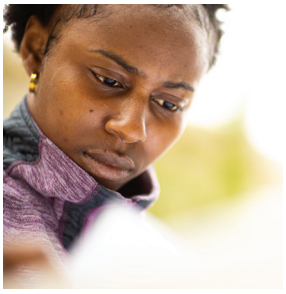
Brianna's first math course at Columbus State was the new corequisite course for College Algebra, where she saved time and money by accelerating through two math courses in one semester and paying for five credit hours instead of nine ($600 tuition savings). The course was demanding, but the format kept Brianna accountable and she flourished. She continued her STEM track with strong grades. Now with her associate's degree in hand, Brianna has been accepted into The Ohio State University, where she plans to pursue a degree in math and explore a career in business data analytics, actuarial science, or cryptography. The average annual salary for these careers are much higher than the median annual income in the Hilltop community where Brianna's education started.

# TRANSFORMING AN INSTITUTION TO IMPROVE STUDENT OUTCOMES

Columbus State Community College is a two-year institution that has transformed itself to create greater equity and better student outcomes. This transformation began in September of 2010, when the presidents, trustees and other high-level officials for 22 community and technical colleges in Ohio met to discuss why more than half of the state's students who entered public colleges each year failed to graduate—and to see what could be done about it. The president of Columbus State Community College, Dr. David Harrison, was among those attending these meetings in Dublin, OH.

Like so many others there, Harrison brought a trove of compliance data from the school. That data showed that Columbus State's three-year graduation rate for first-time, full-time students was just eight percent. More than half of incoming students placed into at least one developmental course. Fall-to-fall persistence rates were weak: Only 49 percent of full-time students who enrolled in 2012 returned the following fall. The data also showed, according to Dr. Harrison's analysis, that no matter the state of the regional economy, lower-income students and students of color were disproportionately left

**ONLY 49 PERCENT OF FULL-TIME STUDENTS WHO ENROLLED IN 2012 RETURNED THE FOLLOWING FALL.**



Semester-to-semester retention rates among African-American students that participated in three or more success initiatives increase to 81 percent in 2018, up from 68 percent in 2015. And the school reduced the gap in course completion between white and black students from 22 percentage points in 2012 down to 13.7 percentage points in 2018.

behind. Working with the school's faculty and administration, Harrison decided to revolutionize the way Columbus State educated its students by implementing clear initiatives focused on redesigning the math experience. These Redesign Initiatives would help Harrison and Columbus State achieve the goal of creating educational equity by:

1. leveraging data for student-centered, as opposed to institution-centered, outcomes;
2. accelerating completion of gateway courses in the first year; and
3. supporting faculty engagement in the redesign of developmental courses.

To launch these initiatives, the college invested in data and analysis systems to better understand the needs of underserved populations, starting with those in developmental courses. They implemented personalized learning tools into their developmental math programs and redesigned the classroom experience to enable students to study effectively, work one-on-one with instructors, and collaborate with their peers.

By redesigning the teaching and learning experiences and using intelligent adaptive learning systems to support those efforts, Columbus State began to see groundbreaking changes.

**COLUMBUS STATE BEGAN TO SEE GROUNDBREAKING CHANGES.**

**Math Redesign Initiatives**

| Term | Initiative |
|---|---|
| 2012 | Redesigned dev math emporium model |
| 2014 | Implement ALEKS and adjust the dev math sequence from 5 courses to 3 |
| Summer 2017 | College Success Express pilot |
| Fall 2017 | Corequisite College Algebra course pilot |
| Spring 2018 | ALEKS PPL Placement Bootcamp Pilot |

**THE RETENTION GAP BETWEEN BLACK AND WHITE STUDENTS NARROWED FROM 15 PERCENTAGE POINTS TO 3 PERCENTAGE POINTS IN 2018.**

In fact, Columbus State's overall course completion among all students was nearly 74 percent in 2018, up from 67 percent in 2012. Semester-to-semester retention rates among black students that participate in at least three success initiatives increased to 81 percent in 2018, up from 68 percent in 2015. And the school reduced the gap in course completion between white and black students from 22 percentage points in 2012 down to 13.7 percentage points in 2018.

Innovative programs and redesign initiatives, including these, resulted in improved student outcomes and national recognition when Columbus State received the Leah Meyer Austin award from Achieving the Dream in 2019. They have become a model for other schools incorporating interventions and student-based success initiatives. Columbus State has seen the biggest gains in semester-to-semester retention of African-American students who participate in three or more success initiatives. The retention gap between black and white students has narrowed from 15 percentage points (68% for blacks in 2015) to 3 percentage points in 2018.* These success rates among Columbus State's 46,000 students also showed that systemic change could be achieved at scale.

*Data is sourced from 2019 Leah Meyer Austin Award, Columbus State Community College, Achieving the Dream, February, 2019, https://bit.ly/2Dpg5d2.

# Redesign Initiative
# RETHINKING DEVELOPMENTAL MATH

Dr. Harrison, the administration, and the faculty at Columbus State knew that developmental math was a barrier to graduation. Nearly two-thirds of all full-time students entering community college are placed in at least one developmental math section, where, according to a recent study, students are 74 percent more likely to drop out of college than peers who do not take developmental courses.

"We had seen the data," recalls Kelly Hogan, Columbus State's Executive Director of College Completion, "and I knew how hard everyone had been working—how hard my students and fellow colleagues had been working—yet despite all that effort, students weren't succeeding."

Columbus State decided to pilot a new sequence of math courses that would accelerate student progress through developmental math. They redesigned and consolidated the developmental math sequence from five courses to three courses, all included in the new Math 1099 sequence. They also changed the nature of the classroom experience from the physical layout of traditional classrooms to a lab environment. This "emporium" model encouraged customized instruction and individualized learning. In the newly-designed math lab, up to 60 students can learn together.

"It is a completely different kind of environment than the traditional developmental math class," says Hogan. "We have two instructors in the double-lab and a tutor or a learning specialist for support, each floating as resources between students."

**STUDENTS ARE 74 PERCENT MORE LIKELY TO DROP OUT OF COLLEGE THAN PEERS WHO DO NOT TAKE DEVELOPMENTAL COURSES.**

# Redesign Initiative
# ALEKS IN THE EMPORIUM

In 2014 Columbus State implemented ALEKS, McGraw Hill's personalized and adaptive learning system, into its developmental math redesign. Rooted in research and analytics, ALEKS ensures that no matter where students start, even if they have very little foundational knowledge, they can complete the course successfully. Students are presented only with topics that they are ready to understand, a technique that boosts confidence and retention. A crucial part of the school's math redesign also included student performance and accountability. "Accountability was key," says Jessica Lickeri, Associate Professor. "Part of what

**RETENTION RATES IN DEVELOPMENTAL MATH ALSO GREW FROM 49 PERCENT TO 65 PERCENT.**

we do is teach our students how to be students, so we show them the value of things like attendance, punctuality, homework completion, and organizing your homework in a notebook—we've embedded all these values into our emporium."

The results are impressive. According to Columbus State, the average success rate for their traditional developmental math courses was less than 50 percent between 2010 and 2012. The success rate for the new summer pilot programs, Math 1099, averaged about 60 percent over the same period. By 2018, after ALEKS was implemented, an average of 68 percent of students successfully completed the redesigned developmental math course. Retention rates in developmental math also grew from 49 percent to 65 percent. More importantly, success rates for all demographic groups improved, notably African-Americans who had a seven percentage point increase. The school has witnessed improved outcomes across age, gender and racial groups.

**Bridge to College Math Success Rates by Demographic Category***

| Demographic | 2013-14 | 2014-15** | 2015-16 | 2016-17 | 2017-18 |
|---|---|---|---|---|---|
| ≤ 24 yrs | 60% | 66% | 65% | 68% | 68% |
| ≥ 25 yrs | 60% | 67% | 63% | 67% | 68% |
| Female | 63% | 67% | 65% | 69% | 69% |
| Male | 58% | 65% | 63% | 67% | 67% |
| African American | 53% | 60% | 57% | 61% | 60% |
| Other | 60% | 66% | 64% | 68% | 69% |
| White | 63% | 69% | 68% | 71% | 73% |
| **Total** | **60%** | **66%** | **64%** | **68%** | **68%** |

*Data sourced from Columbus State Office of Institutional Effectiveness
**First year with ALEKS

## Lessons from ALEKS

The investment in student performance is clearly working at Columbus State, with over 16,000 students participating in this model since 2012 and enrollments growing each year. Students have the opportunity to accelerate through the developmental math sequence, typically completing it one semester earlier than they otherwise would have in a traditional developmental math model.

Using ALEKS improves the effectiveness of teaching developmental math. According to Jessica Lickeri, this starts with the realization that "remediation does not have to be a linear process. Students start at different places. They come from different backgrounds." In a traditional classroom, this difference in knowledge gaps has always been a challenge for instructors—forcing them to "teach to the middle" leaving some students behind. But using ALEKS has helped Columbus State faculty work more effectively with all their students. The program has also helped them develop other success initiatives to help students advance.

**"REMEDIATION DOES NOT HAVE TO BE A LINEAR PROCESS. STUDENTS START AT DIFFERENT PLACES. THEY COME FROM DIFFERENT BACKGROUNDS."**

- Jessica Lickeri, Associate Professor and Lead Faculty for Corequisite College Algebra

# Redesign Initiative
# A COREQUISITE MODEL TO PROMOTE ACCELERATION

With the success of the developmental math emporium, faculty then piloted a corequisite College Algebra course—where students who test just below college level are placed into a credit-bearing College Algebra course with study skills and prerequisite supports to complement the college-level curriculum. This corequisite course uses the "flipped classroom" model to engage students in active and collaborative learning in class, and out-of-class practice using ALEKS.

All the prerequisites for College Algebra are built into the ALEKS course, but each student receives only the prerequisites he or she needs. With a required weekly set of practice problems in ALEKS, students are held accountable for completion of their work—and when students struggle, the system alerts instructors which students need help the most. This "just in time" approach provides a multi-layered component of "scaffolding," an embedded support system that allows students to accelerate and pass the college algebra sequence—taking the equivalent of two courses (or 9 credit hours of Intermediate Algebra and College Algebra) down to a single, 5-credit course.

As with other schools, College Algebra at Columbus State has traditionally been a singular "gateway course" that students must pass in order to progress toward their degree. Initial data shows that Columbus State's use of the corequisite model has bolstered course completion rates in math, especially for underserved students, creating a larger pool of persisting learners and college graduates.

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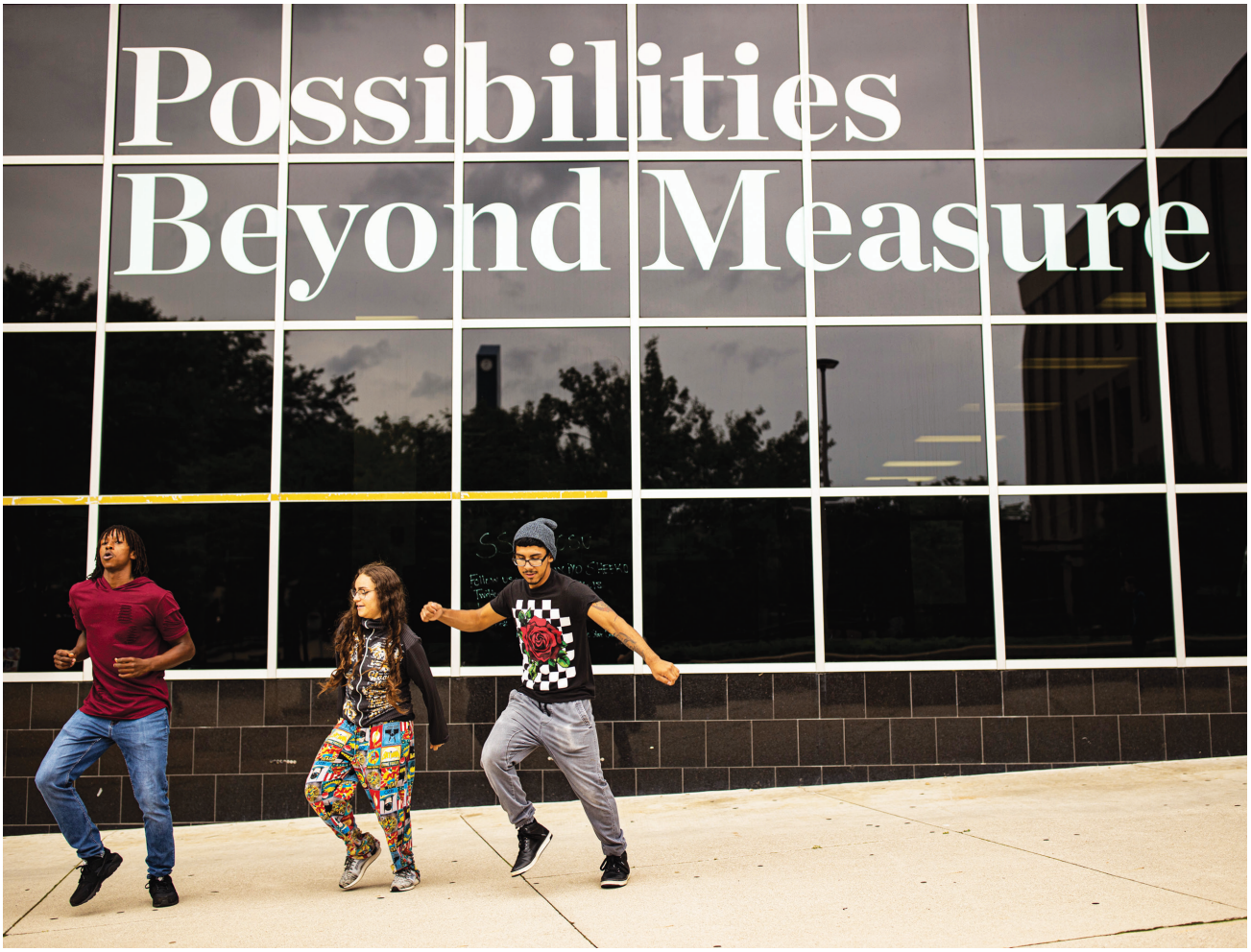



## CSCC College Algebra Corequisite Model

- Cohort, with 1 instructor for support and credit-level course
- A just-in-time approach with support embedded into the College Algebra course
- 5 credit hours vs. 9 (traditional = 5 for Intermediate Algebra + 4 for College Algebra)
- Flipped Learning Model with a focus on groupwork and dedicated coverage of study skills
- Weekly ALEKS assignments

Brianna Swain passed her corequisite course with an A by working in ALEKS for about 10 hours a week and following her instructor's plan. In addition, Brianna also saved time and money by taking 5 credits instead of 9 credits, saving about $600 in tuition. The overall results for corequisite students are also impressive, especially for African-American students, where success rates are 52 percent, a 20 percentage point increase compared to peers taking the traditional College Algebra course. The college views corequisite courses as a promising practice as all student groups are performing at the same level or higher than the students in the traditional course with overall success rates seeing a 10 percentage point gain. As a result, the department is now full scale with corequisite College Algebra, offering 46 sections for the fall of 2019.

**SUCCESS RATES ARE 52 PERCENT, A 20 PERCENTAGE POINT INCREASE COMPARED TO PEERS TAKING THE TRADITIONAL COLLEGE ALGEBRA COURSE.**

### College Algebra Success Rates by Demographic Category*

| Demographic | Corequisite College Algebra with ALEKS | | Traditional College Algebra | |
|---|---|---|---|---|
| | **Student Count** | **Success Rate** | **Student Count** | **Success Rate** |
| ≤24 yrs | 261 | 54% | 954 | 41% |
| ≥25 yrs | 79 | 48% | 397 | 45% |
| Female | 157 | 57% | 685 | 57% |
| Male | 183 | 48% | 666 | 48% |
| African American | 90 | **52%** | 289 | **33%** |
| Other | 76 | **55%** | 283 | **43%** |
| White | 174 | **51%** | 779 | **45%** |
| First generation | 156 | 50% | 579 | 43% |
| Non-first generation | 145 | 59% | 558 | 42% |
| **Total** | **340** | **52%** | **1,351** | **42%** |

The data are limited to non-dual enrollment students that do not place into college level math.
*Data sourced from Columbus State Office of Institutional Effectiveness.

Corequisite College Algebra with ALEKS closed a 12 point gap between white and African American students.

Redesign Initiative

# ALEKS PLACEMENT, PREPARATION AND LEARNING (ALEKS PPL)

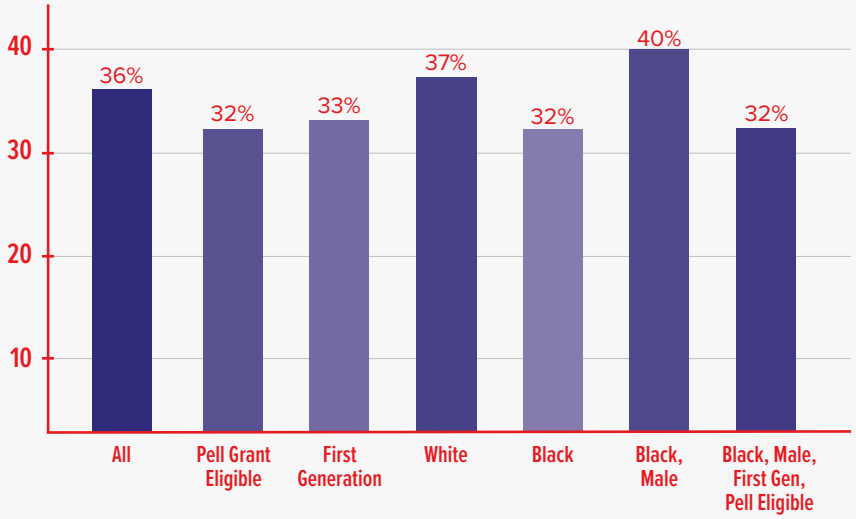
## Place Higher in Week 1

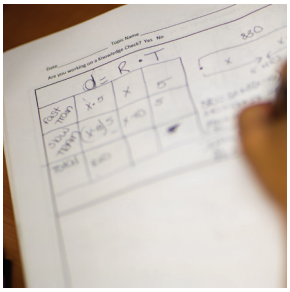
With the success of ALEKS, faculty realized they could use the system to create more positive change—using ALEKS Placement, Prep and Learning (ALEKS PPL) to ensure students are properly placed. After witnessing the positive effects of students placing higher by "dusting off the cobwebs" in the ALEKS Prep and Learning Modules, instructors wanted to help all students take advantage of this opportunity. Now all students who test into the 1099 sequence have a chance to improve their placement with ALEKS PPL. The placement teams at Columbus State knew that students like Brianna who spend an average of 6-8 hours in the Prep and Learning Modules often place higher, so instructors created a way to carve this review and refresh period into the first week of the math emporium, with coursework beginning in the second week. Every semester, several highly-motivated students have even been able to test directly out of 1099 and into college-level math. These pilots are full scale as of Fall 2019.

**INSTRUCTORS CREATED A WAY TO CARVE THIS REVIEW AND REFRESH PERIOD INTO THE FIRST WEEK OF THE MATH EMPORIUM.**

In the past two years of piloting with about 600 students, overall about one third of students place at least one level up, and about half of students who place at the lowest level of 1099 move up at least one level in the sequence. That trend continued into Fall of 2019.

**ALEKS PPL Week 1 Bootcamp Fall 2019**
**Percentage of Students Who Increased their Math Placement**



## College Success Express Bootcamp

Columbus State also continues to grow its College Success Express Bootcamp, which is a two-week program implemented in Summer 2017 that focuses on accurate placement and college success skills. The goal is to support the college transition for underserved, often first-generation college students. “We have been able to meet and sometimes beat retention and GPAs of peers at CSCC,” shares Lauren Jones, program director. “Some students do not understand the high stakes nature of placement tests, so we offer a support system to help them transition into college and focus on skills necessary for their first semester gateway coursework.” Like Brianna, these students can review and refresh their math skills in ALEKS PPL to improve their math placement score, ultimately saving them time and money. From an initial pilot of about 50 students, to 80 students in Summer 2019, Columbus State continues to expand this college readiness summer opportunity.

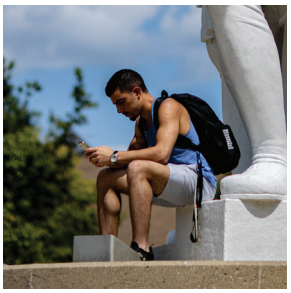
# EVOLVING ROLE OF THE INSTRUCTOR

At Columbus State, faculty have been the most important agents of change in the systematic redesign of developmental math. “The collaborative learning in the corequisite classes obviously requires an instructor,” says Jessica Lickeri, who has found that students who use ALEKS outside of class come with lots of specific questions about their assignments. “Students come to class as active learners,” she says, “and we are empowered to answer those questions more effectively, to be active and immediately be responsive to students in class.”

The difference that instructors feel in their improved effectiveness is profound. Amy Hatfield recalls feeling helpless when teaching traditional College Algebra: “I remember standing in front of my class and watching each of my students, one by one, get lost at a different place—but I had to keep marching everyone along with the lecture.” With the redesigned courses strategically using ALEKS, however, she sees the payoffs of assuming a new and more effective role as an instructor.

Embracing a new way of teaching math is a paradigm shift in the way instructors view their students, which, according to Jessica Lickeri, is a change that hasn’t come a moment too soon. “A traditional way of teaching is to assume that students ought to be able to navigate their course books, do their homework, budget their study time, and meet with professors if they have questions or problems,” says Lickeri. “The assumption has been that students ought to know how to study. But what if they don’t? What if they don’t know how? That’s the big difference. Many of our students don’t know the value of strong study skills – for a whole host of reasons – and it becomes our mission at Columbus State to address these skills and set up these students for success.”

**THE DIFFERENCE THAT INSTRUCTORS FEEL IN THEIR IMPROVED EFFECTIVENESS IS PROFOUND.**



"When we set out to do this, the goal was to get our students through math faster. Yes, the results say that the corequisite course is working, but I am also profoundly struck by how much more confident the students are. These are students who have never passed a math class before, and now they do. It's incredible."

- Jessica Lickeri, Associate Professor and Lead Faculty for Corequisite College Algebra