



Scaling Co-Requisite Supports at the University of Central Arkansas: Perspective from a Four-Year Higher Education Institution

This summary is part of the Charles A. Dana Center's "Notes from the Field" series, which highlights examples of innovative practices from colleges, universities, and systems.

Studies indicate that long developmental mathematics sequences are barriers to student success, which are complicated by several exit points such as students not enrolling, not passing, and/or not persisting to their college-level mathematics course.¹ In response to the detrimental impact of these long course sequences, institutions have begun offering accelerated mathematics pathways to-and-through gateway mathematics courses in one year or less. Emerging evidence shows that this approach best serves a majority of underprepared students who can succeed in gateway mathematics courses with appropriate support.

Across the nation, institutions are implementing one-semester co-requisite models, which refer to the practice of placing students directly into college-level courses regardless of preparation, and providing them with supports for just-in-

TAKEAWAYS

- *Examining institutional data across long developmental mathematics sequences identifies barriers to student completion of credit-bearing mathematics courses.*
- *Full-scale corequisite support serves all underprepared students across a range of ACT scores.*
- *Using a common textbook, course sequence, and final exam across credit-bearing mathematics courses creates a clear, consistent course for all students, both college ready and underprepared.*
- *Student success can lead to unexpected challenges, such as uneven teaching loads and classroom scheduling concerns.*

time instruction.² One four-year institution implemented and scaled corequisite models for its Quantitative Literacy and College Algebra courses that led to significant student success and completion rates nearing 90% for underprepared students.

Background

The University of Central Arkansas (UCA) is a public research institution located in Conway, Arkansas. With over 11,350 undergraduate and graduate students, the university offers 154 certificates and degrees.³ In 2011, UCA was one of nine universities in Arkansas selected for the Complete College America Challenge, a program focused on raising college completion rates and enhancing student success in part through reform of developmental courses. Following the lead of other institutions across the country, UCA initially adopted the Emporium Model to redesign its developmental mathematics course sequences. This model required additional time for faculty to train in a modular, computer-based course called Progressive Mathematics. Students entering the university with an ACT math subscore of less than 19 were required to complete either 10 or 15 modules of the Progressive Mathematics course in order to progress into their credit-bearing Quantitative Literacy or College Algebra course.

Challenges

After several years of using the Emporium Model to improve student success in developmental mathematics courses, “the completion data was just abysmal,” said Amy Baldwin, director of University College at UCA. Only 25–30% of students were completing the Progressive Mathematics coursework in one semester while the remaining students took up to two additional semesters to complete the required modules. Instead of shortening the time a student spent in developmental mathematics coursework before progressing into a credit-bearing gateway mathematics course, the opposite was occurring. Even worse, some students were not completing their requirements for this non-credit-bearing Progressive Mathematics course.

According to Kurt Boniecki, the associate provost for instructional support, the University of Central Arkansas was not alone in reporting disappointing student outcomes for its Emporium Model. Other Arkansas institutions were reporting similar failure rates. Boniecki thought the model worked well for students who were self-disciplined and merely needed a refresher, and UCA data showed the model was clearly not working for the majority of its students who needed developmental math.

While the university was implementing its Emporium Model to redesign its developmental mathematics course sequences, it also began pairing a transitional writing course with a college writing course, based on Peter Adams’ Accelerated Learning Program (ALP). Baldwin previously worked as Arkansas project director for Complete College America and had coordinated implementation of the ALP initiative at nine Arkansas institutions. In the course of implementing the ALP model, she became aware of a similar co-requisite model for transitional math courses. Having witnessed first-hand the improved success rates in the writing course, Baldwin was enthusiastic about trying something similar—a co-requisite model in mathematics.

Solutions

In 2014, with support from Baldwin and Boniecki, University College faculty member Keith Pachlhofer piloted a co-requisite mathematics course in Quantitative Literacy. He taught both the Quantitative Literacy course and its corequisite support class, Foundations of Quantitative Literacy (FQL).

The pilot co-requisite course was structured as a co-mingling of college-ready and underprepared students in the same class. The underprepared students received additional supports through the FQL course in which their attendance was linked to their credit-bearing mathematics course. This policy promoted student attendance in

both classes. One hundred percent of students in the pilot course passed the credit-bearing Quantitative Literacy mathematics course.

In Fall 2015, another co-requisite course was implemented, this time offering four sections of College Algebra. Again, the credit-bearing mathematics courses were a co-mingling of college-ready and underprepared students. In contrast to the pilot for Quantitative Literacy, the Foundations of College Algebra (FCA) co-requisite support course was taught by the same instructor in only one section; the other three sections had different instructors for the College Algebra course and its FCA course. The scaled pilot in 2015 achieved significant results: 82% of students passed the College Algebra course. In continuation of experimenting with innovative ideas, in 2015, mathematics faculty delivered an eight-week intensive Intermediate Algebra course followed by an eight-week intensive College Algebra course. According to Baldwin, however, the scheduling proved to be too disruptive to continue.



The university continued to implement different co-requisite models. One model co-mingled college-ready and underprepared students in the credit-bearing course and, in three out of four pilot classes, placed underprepared students with a different instructor for the co-requisite course. Another model had the same instructor teach both courses to classes consisting only of underprepared students. Both models were successful, but Charles Watson, associate professor of mathematics and coordinator of College Algebra and Quantitative Literacy, shared that student and faculty feedback favored the model that placed underprepared students together (not co-mingled) with the same instructor for both courses. Because University College faculty were teaching the co-requisite courses, it works best to have them teach the credit-bearing course as well.

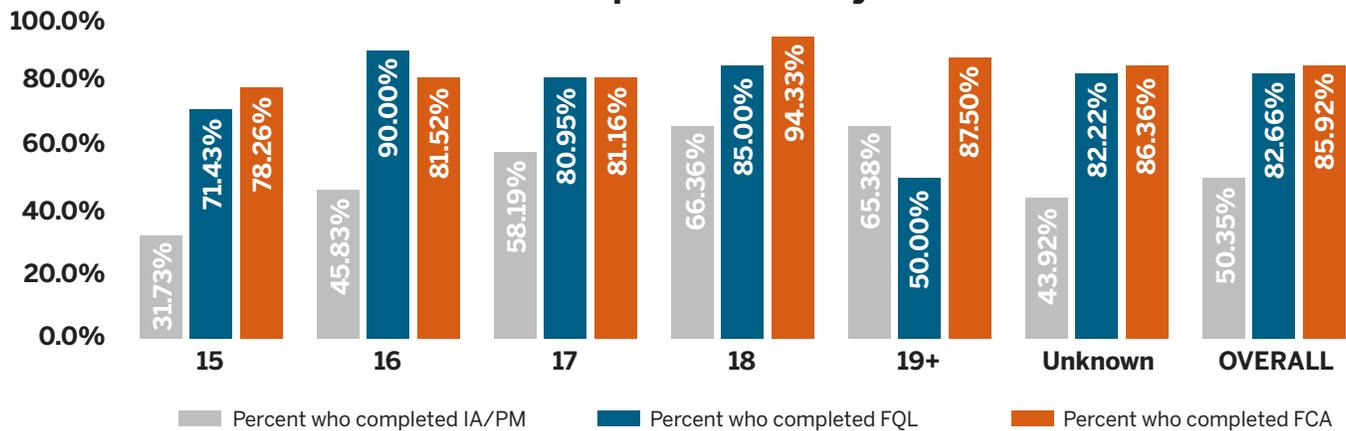
Although there is a difference in who teaches college-ready versus underprepared students, there is intentional use of a common textbook, course sequence, and final exam for College Algebra. Fall 2017 data on student success showed that both college-ready and underprepared students passed College Algebra at a rate of 80–85%. At present, the Quantitative Literacy courses also have a common textbook and course sequence, and a common final exam is in development. Completion rates in the Quantitative Literacy course were significant at more than 80% for Fall 2017.

Results

The co-requisite mathematics courses implemented at the University of Central Arkansas have shown remarkable success (see Figure 1). The differences in completion rate by ACT for intensive Intermediate Algebra and Progressive Math courses from 2012 to 2015 and the co-requisite Foundations courses for Quantitative Literacy and College Algebra from 2015 to 2017 have made it “hard to argue for the Progressive Math courses,” said Boniecki, who collaborated with the mathematics department and University College to implement full-scale, co-requisite mathematics courses in Fall 2017. He understood that math faculty who had worked on the Progressive Math implementation were understandably disappointed by the decision to transition to full-scale, co-requisite mathematics courses. Boniecki credits their willingness to make a data-driven decision because “math faculty . . . trust the numbers.”

Figure 1.

University of Central Arkansas Completion Rate by ACT



Results for full-scale implementation of the co-requisite model are impressive, but they do not diminish the challenges that the university has experienced and continues to face. The dramatic improvement in student success rates for credit-bearing mathematics courses in the fall semester led to lopsided spring semester scheduling. Consequently, math faculty adopted a “6-2” load, teaching three courses and their co-requisites in the fall semester, and one course and its co-requisite in the spring. Baldwin concedes the university is still wrestling with this scheduling issue. Also, credit-bearing mathematics courses had an estimated 40 students enrolled while the co-requisite support courses were split into having 20 students each. With only a handful of available classrooms large enough to accommodate 40 students, scheduling in the fall continues to present challenges.

Along with logistical considerations, there are also curricular challenges. University College faculty member Leslie Gomes teaches both the College Algebra and Quantitative Literacy co-requisite support courses. She found aligning the co-requisite support course materials for College Algebra to be largely a matter of matching prerequisite skills to the content. The co-requisite support materials for Quantitative Literacy have been more difficult to align because it involves improving prerequisite knowledge, which is much harder to map and can vary tremendously from one student to the next. “In College Algebra, I know where the students are going to make a mistake before they even make it,” said Gomes, which makes it clearer for her to emphasize skills required to complete a problem. However with Quantitative Literacy content and its emphasis on real-world situations, students’ own life experiences, or lack thereof, create a more challenging task of educating students about the concepts underlying the mathematics.

With co-requisite courses now at full scale at the University of Central Arkansas and success rates higher than the national average, Boniecki acknowledged, “We’re still early in this, but the data is holding up.” Watson echoed Boniecki’s enthusiasm: “We’re approaching 90% proficiency in College Algebra, so something must be working!”

Contact information

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Endnotes

¹ <https://dcmathpathways.org/sites/default/files/resources/2016-11/The%20Case%20for%20Mathematics%20Pathways.pdf>

² <https://dcmathpathways.org/sites/default/files/resources/2018-02/Co-req%20supports.pdf>

³ <http://uca.edu/president/quick-facts/>

Credits

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Figure 1 printed with permission by Keith Pachlhofer.

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The Center was founded in 1991 at The University of Texas at Austin. Our staff members have expertise in leadership, literacy, research, program evaluation, mathematics and science education, policy and systemic reform, and services to high-need populations.

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