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Lessons from the Dana Center's Corequisite Research Design Collaborative Study

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Research has shown that the traditional system of multisemester prerequisite developmental education hinders academic progress for large numbers of students and has disproportionately negative effects on students of color and students from low-income backgrounds.[1] In response, there has been an increased national interest in implementing corequisite remediation in community colleges and four-year institutions, with the goal of better helping incoming students complete gateway college-level math and English courses.[2] Corequisite remediation involves placing students who have been designated as underprepared directly into college-level courses with corequisite supports—such as in-class tutoring, online learning labs, or a supplemental class— rather than making them take non-credit-bearing developmental courses first. As multiple studies conducted across the country demonstrate that granting students access to college-level courses through corequisite remediation leads to improved student outcomes, the number of corequisite courses—and the number of colleges that offer them—has increased.[3] Despite the plethora of studies, there are still questions about which practices can address the needs of diverse groups of students, particularly students who struggle with basic math or English skills. Additionally, multiple research studies illuminate how equity issues persist in college and course placement among some student subpopulations, such as Hispanic or Latino and Black students.[4] More evidence is needed to better understand how corequisite courses affect students' ability to complete their course and graduation

requirements, and future research should examine how different student groups fare in different types of corequisite courses.

Starting in 2020, through the Corequisite Research Design Collaborative (CRDC), the Charles A. Dana Center designed an initiative for implementing equity-minded, holistic corequisite course models to scale at four partner institutions.[5] These institutions comprise three Minnesota colleges—Fond du Lac Tribal and Community College, St. Cloud Technical and Community College, and St. Cloud State University—and Houston Community College in Texas.[6] The goals of the collaborative are to dramatically increase the number of students enrolled in corequisite courses that are implemented with evidence-based design principles and to encourage students' self-advocacy in class. These principles guided the design and delivery of instruction and cocurricular supports that help students complete gateway math and English courses.[7] Researchers from the Center for the Analysis of Postsecondary Readiness (CAPR), led by MDRC and the Community College Research Center, partnered with the Charles A. Dana Center to study and offer formative feedback about the implementation of corequisite course models at the four participating colleges (though the study was not meant to measure the fidelity or efficacy of a particular model). The researchers also sought to better understand if and how the corequisite courses integrated an equity focus that better supported students' academic and cultural learning styles in order to reduce the equity gaps that exist in math and English course completion. Three research questions guided the evaluation study:

1. How did the CRDC colleges implement holistic student supports in gateway corequisite math and English courses?
2. What did corequisite course leaders at the CRDC colleges consider to be the successes and challenges of implementing their courses? What were their strategies for improvement?
3. How did students, faculty, and other stakeholders experience the holistic corequisite courses? What successes and challenges did they identify as part of their experiences in these courses?

Data Sources and Analysis

This research brief highlights findings from interviews, focus groups, and the research team's observations on the design and implementation of corequisite courses at the four CRDC colleges, as well as findings from a survey administered to students who were enrolled in these courses during the fall 2021 semester or spring 2022 semester.

- During both semesters, CAPR researchers conducted 13 individual interviews or focus groups with instructors who taught corequisite courses, campus staff members from advising and tutoring centers who worked closely with students taking corequisite courses, or college administrators who helped oversee corequisite courses at the four participating colleges. Toward the end of the spring 2022 semester, two small student focus groups were conducted at Fond du Lac—one with a group of five students from the corequisite statistics

course, and another with a group of six students from the corequisite English course. Four individual student interviews were conducted virtually with students enrolled in St. Cloud State corequisite courses.

- With the help of corequisite instructors at the participating colleges, CAPR researchers also administered an online student survey to a total of 171 students who were enrolled in either corequisite math or English courses at the three Minnesota colleges (Fond du Lac, St. Cloud Tech, and St. Cloud State) during both semesters.[8] Due to the small sample size, the survey findings are not generalizable, but some response patterns are worth highlighting in conjunction with the qualitative findings. Table 1 shows the student enrollment numbers in corequisite courses by college.

TABLE 1. Corequisite Course Enrollment at CRDC Colleges

College	Corequisite Course	Number of Students Enrolled	
		Fall 2021 Semester	Spring 2022 Semester
Fond du Lac Tribal and Community College	Statistics Preparation	19	19
	College Prep English II	18	17
St. Cloud State University	Bridge to Mathematical Thinking	44	20
	Bridge to Statistical Thinking	16	20
St. Cloud Technical and Community College	Bridge to Elements of Math[a]	7	NA
	Principles of Intermediate Algebra Accelerated	24	34
	Bridge to Statistics	32	35
Total = 305		160	145

SOURCE: Data collection information request forms completed by CRDC college liaisons.

NOTES: Houston Community College corequisite courses included Corequisite for College Algebra, Corequisite for Math for Business and Social Sciences, Corequisite for Contemporary Math, Corequisite for Elementary Statistical Methods, and Integrated Reading and Writing. Because only partial enrollment data were available at the time of the study, the team chose not to include Houston Community College's enrollment numbers in this table.

NA = not applicable.

[a]Bridge to Elements of Math at St. Cloud Technical and Community College was only offered during the fall 2021 semester.

- Two CRDC gatherings, led by the Dana Center, were held in May and July 2022. CAPR researchers attended and recorded notes as corequisite stakeholders workshopped topics related to implementing corequisite courses, integrating equitable practices through instruction and support, and addressing challenges to successful implementation collaboratively.

Corequisite Course Description

Table 1 shows the number of students who enrolled in corequisite courses at the three CRDC colleges in Minnesota. While Houston Community College was part of the CRDC project, only partial enrollment data were available at the time of the study. All four colleges offered corequisite math courses in spring and fall, while only two colleges, Fond du Lac and Houston Community College, offered corequisite English courses both semesters. Most of the corequisite courses were offered in person and used the support corequisite course model, which involved scheduling a college-level math or English course that included students who placed out of developmental education alongside a separate, supplementary support course, which was offered before, after, or on different days from the college-level course. These support courses had smaller class sizes and, according to corequisite course liaisons at the colleges, they provided students additional time to become familiar with the content taught in their paired college-level courses. However, St. Cloud Tech also used an embedded corequisite model that involved a cohort of students taking a developmental course scheduled back to back with a college-level course, which students conceptualized as a single course. All CRDC colleges' corequisite math courses were integrated into their math pathways—which, according to the Dana Center, are developmental and college-level course sequences that align students' academic and career goals and accelerate the completion of college-level math courses.[9]

Findings

- **The implementation of corequisite support courses helped students understand course content and increased their coursework engagement relative to their engagement in their corequisite college-level courses.**

According to testimonials from both instructors and students, the small enrollment sizes (about 23 students on average) of the separate support math courses helped instructors customize the type of content review or activities they offered students. Some instructors described this customization as useful for identifying content that was especially challenging for students in the corequisite college-level courses and methods of learning that students struggled with. For instance, in Fond du Lac's Statistics Preparation support course, the instructor and tutor described using their class time to assess how well students understood the word problems that were introduced in their larger Introduction to Statistics college-level class. The instructor asked students to read problems out loud to better assess their reading skill competency levels. Since many of the corequisite students had low reading levels, she concluded that it

was difficult for them to fully absorb complex statistical concepts and formulas after only one read-through. The instructor indicated that doing multiple read-throughs of the word problems during the support course "[helped her] zone in on problem areas with reading comprehension," which she needed to do to help students better understand the content.

In the separate, supplementary support courses, some instructors described assigning daily homework journals and weekly quizzes to foster regular engagement with course content, with opportunities for students to experience what one instructor described as "productive struggle." Another instructor observed that, over time, completing different engagement exercises in the support course helped students feel more confident asking questions and offering answers during the paired college-level course, adding, "The cool thing is to see some of these [support course] students impart the right answers when they get back into the [college-level] course." In the student survey, a majority of respondents reported favorable perceptions of the tests and quizzes, instructional materials, and instruction in the support course.

Many student survey respondents reported that the additional time and interactions they had in the support courses provided more opportunities to ask questions, work with instructors and peers, and voice their thoughts.

Some students appreciated how their support math course allowed them to receive more personal attention, additional time to go through content step by step with instructors, and the opportunity to keep trying to solve challenging math problems, both individually and collectively as a class. Two students from St. Cloud State noted that their instructor gave them a statistics content worksheet with statistics problems that were "mirror images" of the problems introduced in the paired college-level class the previous day. Both students found it particularly helpful that their supplementary support course instructor regularly attended the college-level corequisite class because later, during the support course, the instructor could then ask students specific questions about what they did and did not understand.

Students participating in focus groups generally said that besides having extra time and help with course content, the supplementary support courses also gave them an opportunity to get to know their peers and their instructors on a more personal level. One Fond du Lac student said, "We talked a lot more in [the support] class, both to our teacher and with each other." Another student added that the smaller support course allowed more time and space to build relationships "since there is no time for that during the [college-level] class and it's harder to do outside of class." A St. Cloud State student said that his support course's more intimate class size made it easier for him to actively participate, because in the Statistical Thinking college-level class, the students were spread out across a much larger auditorium.

When asked about their experiences within both their college-level and support course classrooms, many student survey respondents reported that the additional time and

interactions they had in the support courses provided more opportunities to ask questions, work with instructors and peers, and voice their thoughts. The majority of respondents reported feeling comfortable engaging in class and seeking help from instructors, although a greater number of students reported feeling comfortable with engagement in their support course than in the paired college-level course. This finding suggests that students may have felt more at ease engaging with course material at a time that was dedicated to supporting them, and with peers who were at a similar academic level.

- **Some corequisite courses successfully integrated holistic support services and culturally relevant instruction.**

As part of the CRDC, the three Minnesota colleges incorporated additional student support services and culturally based assignments in their corequisite instruction to better understand the challenges students faced outside of the classroom and to learn more about their backgrounds. The most common service that was integrated into the corequisite English and math courses was in-class or virtual tutoring (or both). At St. Cloud Tech, students who were enrolled in corequisite courses were required to participate in a minimum of 15 hours of free online tutoring through the college's Center for Academic Success. Similarly, students who took St. Cloud State corequisite courses were required to visit the campus math tutoring lab as part of their curriculum and receive online tutoring support provided by Pearson's MyLab Math and McGraw Hill's instructional software. At Fond du Lac, math and English tutors from the campus TRIO program were included in the corequisite courses and helped students during and after their corequisite course time.[10]

Most students who participated in the focus groups described how helpful it was to have a tutor who attended their paired college-level course. Some students added that it was valuable to have tutors colead their corequisite support courses. One student mentioned having a tutor's help in the lab or study hall for the support course once a week, while another said his corequisite instructor advised him to attend "Academic Late Night" events at the end of the semester, right before finals. The events offered tutoring support; students who attended received extra credit. One student explained the value of his tutors beyond the corequisite course, adding, "They want us to graduate, to understand [content] and succeed."

Instructors noted that many of their students' struggles were not academic but personal challenges that impeded how well they did in their corequisite courses. As such, instructors commonly facilitated "check-ins" at the start of the corequisite support courses to help identify students' immediate needs (curricular and cocurricular) and to allow instructors some flexibility to adjust their pedagogical approaches. For instance, an older student who was interviewed mentioned initial struggles with unfamiliar computer functions, such as uploading instructor notes and assignments from the online course management portal. This student reported receiving additional help from the instructor and tutor after sharing this challenge with them during the support course.

Students from Fond du Lac's corequisite English course appreciated that their instructor—who also led the paired support course—started the college-level class with a daily check-in, during which the instructor announced updates on scholarships, food pantry offerings on campus, extra credit opportunities, and local community events. She also encouraged them to practice writing a "life schedule," which students said helped them document and manage their everyday responsibilities—academic, family, work, and social—and reinforced constructive daily habits, such as being on time, staying curious in their learning, and avoiding negative self-talk.

The additional time to assess content understanding during the support course helped St. Cloud Tech math instructors realize that English language learners (ELL) were highly knowledgeable about formulaic content but were challenged by word problems, which often did not easily translate to their native languages. According to corequisite instructors, an influx of ELL students had recently enrolled at St. Cloud Tech, particularly students from Somalia. The instructors identified a need to better explain mathematical concepts in ways that would support students with English language proficiency needs, as well as to respect students who were not familiar with western curricula and modes of instruction. For example, one administrator explained that Somali students learn collectively, which made it a struggle for her to help students understand that they could not copy what someone else was doing just because they were working in a group together. As a result, the corequisite instructors began adopting different approaches that better conveyed math word problems and concepts to their growing ELL student population, such as not using prepositional phrases as much as symbols to explain relationships and actions in math equations.

A senior St. Cloud Tech administrator noted that the professional development training that the college's corequisite instructors received had been essential to increasing their cultural competency with ELL students, explaining, "It's not about math, it's about understanding who you are as an instructor and equity issues that are critical to [ELL students'] math learning." To support its increased attention to equity, the college had recently obtained a grant to hire an ELL coordinator to provide training and guidance to the corequisite instructors and tutors.

At Fond du Lac, instructors incorporated Indigenous cultural lessons into English and math assignments in the paired college-level and support courses. The Fond du Lac corequisite English instructor noted that the courses incorporated culturally relevant materials, such as tribal spiritual lessons that are passed down from generation to generation. Instructors assigned students articles to annotate and review, which gave students an opportunity to connect the material to their own lives. Students were also asked to write a cultural history of their lives and families and then describe how that related to living in a diverse society. Though some students found this assignment rather uncomfortable at first—with some noting it was "super touchy" to write about themselves—most of the students said they eventually found the activity to be beneficial for learning the academic writing process while also learning more about their cultural backgrounds and those of their peers.

- **Instructors and student services staff described implementation challenges related to scheduling corequisite courses and communicating about the courses with students.**

Faculty and staff at the CRDC colleges found it difficult to schedule corequisite courses back to back; it was hard to find a time when both the classroom and the instructor were available. Instructors also reported that some students who took a college-level class with a supplementary support class, regardless of corequisite model, were frustrated that they had to take two math courses. They thought it was a long time to spend in class while still needing to squeeze in time for homework, other courses, and outside responsibilities like work or childcare. Similarly, while nearly all the students participating in the focus groups said their corequisite instruction was beneficial to their learning, some also expressed that they were "not feeling it at first" and that a two-hour back-to-back corequisite course structure was too time-consuming or tiresome. Others suggested changing the format so that the support course would be offered in the evening or on a different day than the paired college-level course, which would allow students a break to process the content from the college-level class first.

Faculty and student services staff said that students did not always understand the format of the corequisite courses. Instructors noted that some of their students assumed the semester would involve eight weeks of developmental algebra followed by eight weeks of college algebra, rather than both courses occurring simultaneously. When a support course was scheduled to immediately follow a paired college-level class, many students did not realize that they needed to stay for the second class. One instructor noted it was important for all corequisite instructors to explain the structure and time commitment of the classes right from the start, because some of her students were confused about whether the support class was a requirement or optional.

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In a similar vein, a student services staff member highlighted how many college advisors were also not aware of key information about the corequisite courses, such as the eligibility and funding criteria. This had posed a challenge when advising corequisite course students. For instance, one student, who was a veteran, said he enrolled in a corequisite course based on his advisor's guidance. He was not told at the time that the GI Bill does not cover course tuition costs for developmental courses, so he had to pay for the course from his own personal funds. It is important for college advisors to be aware of the stipulations that corequisite course enrollment poses, such as limited course payment options.

Related to the corequisite instruction itself, challenges included integrating student supports into the courses and meeting students' needs. Supplemental instructors and tutors were incorporated into support courses. Corequisite instructors said there was a need for similar supports in gateway college-level courses, especially supplemental instructors and tutors who could help facilitate "guided learning areas" for students to work on math problems.

Instructors also said that some students in the corequisite math courses struggled with non-math-related issues and could have used help learning organizational and time management skills within the courses. Instructors encouraged students to seek additional help outside of class and referred them, as needed, to the colleges' Adult Basic Education lab, the writing lab, or the Center for Academic Achievement. Instructors and staff said one of the more recent challenges was knowing how many corequisite sections to schedule in advance, for a couple of reasons: Some college-level courses needed to be linked to certain academic pathways, and overall enrollment had declined (for example, due to the pandemic). Instructors also cited the related challenge of making sure advisors and enrollment staff provided consistent messaging to students about the structure and benefits of corequisite courses, so that students were better informed about what to expect.

Lessons

The findings in this brief—and those included in a supplement to the brief—highlight how the Corequisite Research Design Collaborative colleges implemented holistic student supports, what the successes and challenges of implementing corequisite courses were, and how students experienced their corequisite supports during the fall 2021 and spring 2022 semesters. The following are lessons for colleges to design and implement corequisite courses on their campuses:

- **Work with math and English departments to determine whether there is a need or demand to incorporate holistic supports into corequisite courses.** Given that corequisite courses are relatively new course offerings at community colleges, it would be beneficial for faculty and administrators who are closely tied to these types of courses to work with academic department heads, enrollment specialists, and advising center directors to assess what academic or social supports or resources would be helpful for students. This could mean working with academic department heads to conduct a needs assessment to determine which additional supports help students pass gateway courses, especially when these supports are offered during class time. It is also important for corequisite leaders to integrate campus services—as well as local community services, when appropriate—into the courses.

- **Determine the appropriate corequisite support structure that suits students' and instructors' needs and availability.** It is important for colleges to choose corequisite models that are appropriate, based on instructor availability and students' course scheduling patterns. As mentioned above, the colleges in this study used models that either attached supplementary support courses to college-level courses or embedded corequisite supports into gateway college-level classes. Having the same instructor (or instructors) teach both a college-level course and a support course may also provide students with more consistency in content messaging and course activities. Using the same instructor for both courses would help corequisite leaders know which particular math or English courses should be scheduled, when they can be scheduled, and if there are instructors who can be deployed to teach corequisite courses.

- **Monitor outreach and recruitment for corequisite supports to increase program enrollment into these courses.** In order to increase enrollment in corequisite courses, corequisite leaders could monitor recruitment activities and provide support to advisors and student services specialists to ensure that enrollment targets are met and that students understand what is expected when they enroll in corequisite courses.

More colleges are designing and implementing corequisite courses for students in need of additional support in English and in math gateway courses. Many of these corequisite courses incorporate holistic support components to further ensure students' course completion. The lessons from this brief may offer additional guidance for colleges to provide the appropriate supports to help students better understand course content and successfully persist through other college-level courses and to eventual degree completion. These findings also provide important lessons for better understanding how college administrators and instructional leaders can successfully design and implement corequisite support structures.

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