DO THE DETAILS OF COREQUISITE SUPPORTS MATTER?

EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

Background

A consensus is emerging among scholars, policymakers and higher education administrators that long sequences of developmental education courses intended to help community college students prepare for and successfully complete college math and English courses too often have served as barriers to their progress and degree completion.[1] To address this problem, many community colleges are choosing to mainstream students who place at a mid to high range in developmental math or English assessments by placing them directly into a college-level, credit-bearing course in the subject and concurrently enrolling them in a corequisite course or lab to provide the academic support needed to succeed. This corequisite support model has shown particularly promising results with respect to improving students' chances of successfully completing gateway college courses in math and English, and their likelihood of persisting in college.[2]

Variations in the Design and Execution of Corequisite Supports

Community college systems and individual colleges have made considerable investments in corequisite supports, and these supports have been implemented in myriad ways. Yet, despite overall favorable evidence of improvements in students' outcomes as compared with traditional developmental sequences, we know remarkably little about how to design corequisite supports to maximize students' success. For example:

- Corequisite *instructional formats* can be offered as lectures that are an extension of the college-level course, as just-in-time targeted support provided to groups of students or as individualized tutoring sessions.[3]
- In some cases, the course and corequisite support are *scheduled* consecutively, with the corequisite either immediately before (anterior) or after (posterior) the college course or they may be offered on different days of the week.
- Colleges sometimes seek to foster learning communities by grouping students into *cohorts,* where students attend the same corequisite and college course together, and by having the *same instructor* teach both the corequisite and the college course.
- *Instructor appointments* differ, sometimes being full-time and other times part-time.
- The enrollment *size* of the corequisite can vary considerably, from very large to just a few students.

These and other variations may influence students' outcomes in the college-level math and English courses that the corequisites are designed to support.

Description and Purpose

We capitalized on the variety of corequisite designs in math and English courses implemented across the Colorado Community Colleges System (CCCS) to identify the features of corequisite support courses that are most strongly associated with students' short- and long-term outcomes in college math and English. For college English, we focused on students' successful completion of corequisite-supported College Composition I, grade points achieved in College Composition I and subsequent successful completion of College Composition II. For college math, we included corequisite-supported College Algebra, Introductory Statistics, Math for Liberal Arts, Finite Math and Integrated Math. Outcomes included successfully completing the college math course, grade point achieved in the course, and subsequent successful completion of any second college math course.

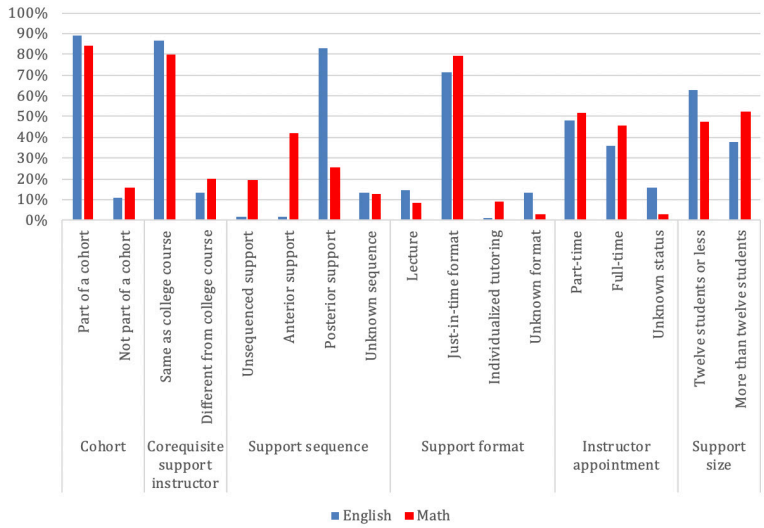
We also examined how different contexts and circumstances of Colorado's community colleges led to different corequisite designs, and we investigated the combinations of features that students were most likely to encounter in corequisite-supported college math and English courses.

Key Findings

Institutional context influenced the design and implementation of corequisite supports.
Interviews with instructors and chairs of English and math departments across the CCCS illuminated the many ways in which differences in college cultures, available resources, course offerings, instructor characteristics and institutional size shaped the design and execution of corequisite supports.

Students encountered different corequisite features.
Figure 1 displays the variability in corequisite features that students encountered. Of the features examined, instructor appointment and corequisite size varied markedly for both English and math. Math corequisites also varied in sequencing relative to the college course.

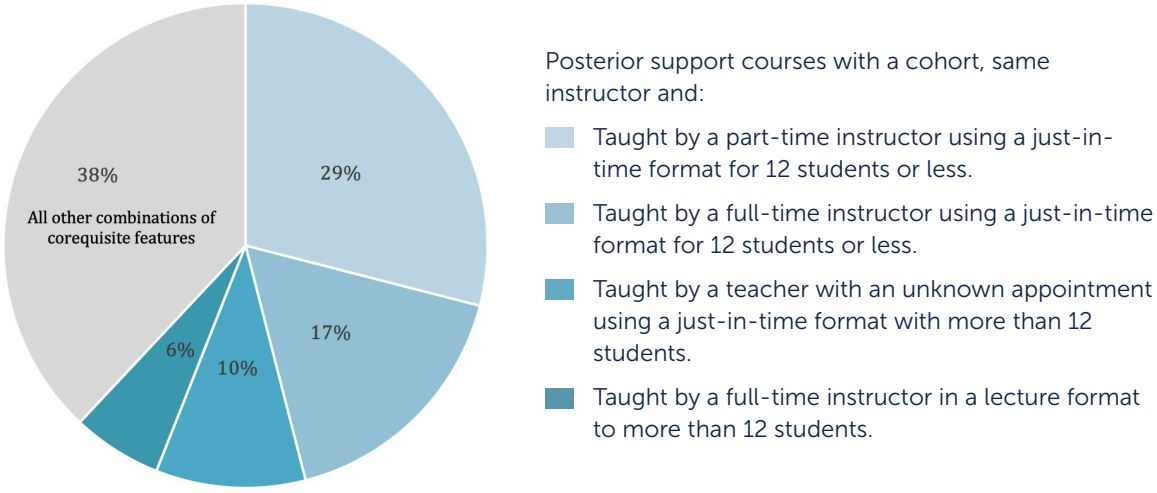
Figure 1. Proportion of student enrollment by corequisite feature and subject



Common combinations of corequisite features.

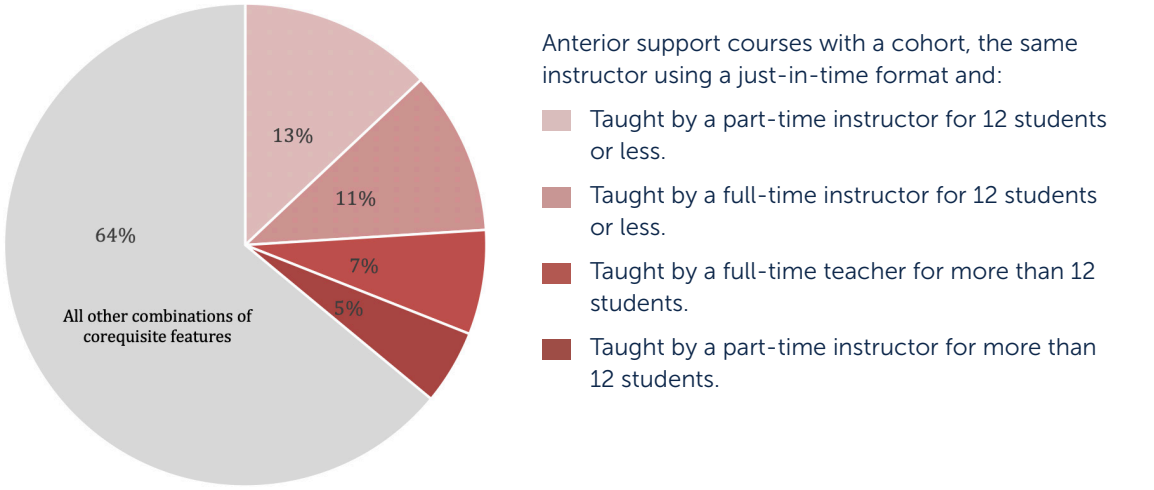
Students were especially likely to encounter certain combinations of corequisite features. Almost two-thirds of students (62%) in corequisite-supported College Composition I enrolled in a support that was taught by the same instructor who taught the college course and that met immediately after the college course (posterior support) (see Figure 2).

Figure 2. The four most common combinations of English corequisite designs



There was greater variation in the combinations of corequisite features encountered by students in college math (see Figure 3). Just over one-third of students (36%) in corequisite-supported college math courses enrolled in a corequisite as part of a cohort that met immediately before the college course and was taught in a just-in-time format by the same instructor who taught the college math course.

Figure 3. The four most common combinations of math corequisite designs



A few corequisite features are especially important for success in English and math.

Table 1 reveals that relatively few corequisite features emerged from this analysis as especially important for students' short-term course outcomes of passing College Composition I and grade points achieved in the course. In addition, there was minimal evidence that particular corequisite features play an important role in the one long-term outcome of passing College Composition II within one year.

Likewise, only a few corequisite features were related to students' short-term outcomes in college math (see Table 2). Unlike English, however, one corequisite feature, detailed below, did emerge as important for students' long-term outcome of passing a second college math course within one year.

Features of English corequisites that are important for students' success in college English.

- Students taught by the same instructor in their College Composition I course and their corequisite support had markedly higher chances of success and higher grades when compared to peers in corequisites taught by a different instructor.
- Students enrolled in English corequisites formatted as individualized support had moderately better grades in College Composition I than students enrolled in corequisites delivered in a conventional lecture format.
- Unexpectedly, students who took English corequisites as part of a cohort had significantly lower chances of passing College Composition I and significantly lower average grades in College Composition I as compared with students who were not part of a cohort.

Features of math corequisites that are important for students' success in college math.

- Students enrolled in a posterior corequisite support, scheduled immediately after their college math course, had a significantly higher chance of passing the college math course and significantly higher average grades in college math, as compared with students in unsequenced support courses. Students in a posterior support course also had a greater chance of passing a second college math course conditional on attempting a second math course within one year.
- Students who were part of a cohort sharing the same college math course and corequisite support had a higher likelihood of passing their college math course and higher average grades in college math.
- Students in math corequisites taught by full-time instructors had modestly lower average grades in college math, compared with students in corequisites taught by part-time instructors.

Table 1. Estimated relationships between three course outcomes and selected corequisite features for students enrolled in a corequisite-supported, transfer-level English course

	Likelihood of Passing Composition I	Grade in Composition I	Likelihood of Passing Composition II
	Estimated Percentage Point Difference	Estimated Grade Point Difference	Estimated Percentage Point Difference
Cohort of students in corequisite support and college course			
Part of a cohort vs. Not part of a cohort	−21.5	−0.5	n/s
Corequisite support instructor			
Same instructor vs. Different instructor	+38.0	+1.1	n/s
Support Sequencing			
Anterior support vs. Unsequenced support	n/s	n/s	n/s
Posterior support vs. Unsequenced support	n/s	n/s	n/s
Unknown sequencing vs. Unsequenced support	n/s	n/s	n/s
Support format			
Just-in-time vs. Lecture	n/s	n/s	n/s
Individualized vs. Lecture	n/s	n/s	n/s
Unknown format vs. Lecture	n/s	n/s	n/s
Instructor appointment			
Full-time instructor vs. Part-time instructor	n/s	n/s	n/s
Unknown appointment vs. Part-time instructor	n/s	n/s	n/s
Size of corequisite support			
For each additional 10 students enrolled	n/s	n/s	n/s
Number of Students	14,282	12,978	3,784

Note: See Appendix A for descriptions of the outcomes, the corequisite features and the statistical controls included in the models. A cell containing "n/s" indicates an estimated coefficient that was not statistically significantly different from zero after applying the Bonferroni adjustment, setting the maximum acceptable probability of falsely concluding that there is a relationship between a given corequisite feature and a given outcome to 0.005 (i.e., one half of one percent).

Table 2. Estimated relationships between three course outcomes and selected corequisite features for students enrolled in a corequisite-supported, transfer-level math course

	Likelihood of Passing Transfer-Level Math	Grade in Transfer-Level Math	Likelihood of Passing a Second Transfer-Level Math Course
	Estimated Percentage Point Difference	Estimated Grade Point Difference	Estimated Percentage Point Difference
Cohort of students in corequisite support and college course			
Part of a cohort vs. Not part of a cohort	+4.9	+0.2	n/s
Corequisite support instructor			
Same instructor vs. Different instructor	n/s	n/s	n/s
Support Sequencing			
Anterior support vs. Unsequenced support	n/s	n/s	n/s
Posterior support vs. Unsequenced support	+17.9	+0.5	+17.7
Unknown sequencing vs. Unsequenced support	+12.7	+0.4	n/s
Support format			
Just-in-time vs. Lecture	n/s	n/s	n/s
Individualized vs. Lecture	n/s	n/s	n/s
Unknown format vs. Lecture	n/s	n/s	n/s
Instructor appointment			
Full-time instructor vs. Part-time instructor	n/s	−0.2	n/s
Unknown appointment vs. Part-time instructor	n/s	n/s	+35.7
Size of corequisite support			
For each additional 10 students enrolled	n/s	n/s	n/s
Number of Students	5,262	4,363	716

Note: See Appendix A for descriptions of the outcomes, the corequisite features and the statistical controls included in the models. A cell containing "n/s" indicates an estimated coefficient that was not statistically significantly different from zero after applying the Bonferroni adjustment, setting the maximum acceptable probability of falsely concluding that there is a relationship between a given corequisite feature and a given outcome to 0.005 (i.e., one half of one percent).

Recommendations

Optimize corequisite design with attention to what works best in English versus math.

With respect to the design of corequisite supports, the features that are particularly beneficial in college English are not necessarily the same as those for college math. In addition, when corequisite-supported college math courses were disaggregated by subject (e.g., college algebra, introductory statistics, math for liberal arts), we found that the corequisite features that emerged as important for student outcomes differed to some extent by subject (discussed in the full report). Colleges should keep these differences in mind when designing corequisite supports.

Offer instructors professional support when implementing corequisites, regardless of the corequisite design.

Corequisite supports often require different instructional frameworks than typical developmental education courses or college courses. To help instructors make this shift successfully, community college systems and institutions should consider ways to support their instructors before, during and after the implementation of corequisites, and regardless of the specific corequisite design used. Any professional supports should be made available to both part- and full-time instructors.

For college math courses, offer posterior corequisites organized to create student cohorts.

Students enrolled in corequisites offered immediately after their college math course (posterior support) and/or in corequisites designed to create a student cohort had better outcomes in the college course. Although cohorts can be expensive to implement, offering a posterior support course may be a low-cost, low-effort approach for colleges to improve the outcomes of students in corequisite-supported college math courses, particularly for colleges that already are sequencing college courses and corequisites, albeit with the corequisite preceding the college course.

For college English, prioritize corequisite features that will yield meaningful improvements in students' outcomes.

Students in English corequisites that included certain resource-intensive features — having the same instructor for both their corequisite and their college course, and being taught in an individualized format rather than in a lecture format — had better outcomes in the college English course. However, other resource intensive features, such as corequisites designed to create a student cohort, did not yield better outcomes. Given the resource constraints faced by many community colleges, efforts to optimize corequisite design should be focused on features that are likely to yield the greatest improvements in student outcomes, rather than spread across multiple resource-intensive features, some of which will not realize meaningful gains.

Optimize corequisite supports with institutional context in mind.

Community colleges, even those in a single system, differ markedly in institutional context, administrative challenges, resource constraints and student populations served. It may not be feasible to produce a single list of best practices for designing corequisite supports that will apply equally well to every college. While acknowledging the noteworthy patterns emerging from our findings of particular features that are important for students' outcomes, it seems that, in many respects, corequisites offered in a variety of forms are similarly beneficial for students. Therefore, students may be best served when community colleges design corequisites that are well aligned with their cultural norms, staffing and enrollment, and financial resources. In addition, community college systems should work to ensure robust forums and channels of communication through which administrators, department chairs and instructors at different colleges can share ideas and strategies for optimizing corequisites, especially for colleges navigating similar contexts.

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