CAPR | CENTER FOR THE ANALYSIS OF POSTSECONDARY READINESS

Lessons on Scaling Corequisites

The City University of New York's Transition From Prerequisite to Corequisite Academic Support

Maggie P. Fay
Julia Raufman
Andrea Lopez Salazar
Selena Cho
Farzana Matin
Elizabeth Kopko
Community College Research Center

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Overview

In the fall of 2019, the City University of New York (CUNY) Office of Academic Affairs (OAA) provided colleges with updated guidance for designing and delivering evidence-based corequisite courses and set a timeline for the phaseout of traditional, standalone remediation by fall 2022. This report describes findings from research exploring the first year of full-scale implementation of corequisite courses in the system. It examines how CUNY colleges managed the transition to fully scaled corequisite courses and structured their corequisite offerings and the implications of those choices for early implementation. The scaling of corequisite courses represents a complex change process for colleges and systems to manage. As states and systems begin to implement corequisite course models at scale, important questions face the field, including how colleges navigate the transition from prerequisite to corequisite support, which factors facilitate or hinder the scaling, and how implementation choices shape faculty, staff, and student experiences. This research aims to grow the field's understanding of factors critical to the scaling and implementation of corequisite courses.

The main findings are as follows:

- At the time researchers conducted data collection in the spring of 2023, all participating CUNY colleges had fully scaled corequisite courses in math and English. For many colleges, this marked the culmination of over a decade of experimentation with and expansion of corequisites. By fully scaling corequisite courses, the system navigated a complex transition and managed to do so successfully in the midst of the COVID pandemic.
- While CUNY OAA provided guidance to colleges on aspects of corequisite design, colleges were allowed autonomy to determine the pace of scaling and how best to design courses. We observed variation in scaling timelines and some variation in corequisite models, as well as earnest engagement among faculty and staff to design and continue to improve courses to reflect their campus context and the needs of their students.
- CUNY OAA staff and college faculty and staff described facilitators of the scaling process, including OAA's mandate and timeline for scaling and financial support for course and professional development. The mandate catalyzed experimentation with and expansion of corequisite courses and sometimes cut through departmental inertia or a lack of consensus regarding the next steps in developmental

education reform. The provision of grant funding was critical for moving colleges toward scale and designing course syllabi, curricula, and professional development to prepare faculty to teach the courses.

- Faculty and staff also described hindrances to scaling. The most commonly cited challenge was that the introduction of a new placement algorithm, the mandate to scale corequisites, and the pandemic-induced shift to online instruction occurred roughly simultaneously, making it hard to determine how any one of these factors contributed to changes in student success in introductory English and math courses. Shifts to course delivery modality resulting from the pandemic and challenges with advising into the new courses were also cited as challenges.

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1. Introduction

Reforms to developmental education have been a focus of institutional change in community colleges for over two decades. Developmental education, or remediation, refers to academic support courses in English and math designed to help students build foundational knowledge and skills to prepare them for success in subsequent college courses. Students who failed to meet benchmarks of college readiness in math and English upon admission to community colleges (and broad-access four-year colleges) were often mandated to complete developmental courses before starting college-level coursework. However, rather than supporting preparation, these courses often slowed early postsecondary progress, delayed access to college courses, and contributed to attrition from community colleges. Recognizing these inadequacies, states and systems have been adopting corequisite course structures, which provide corequisite academic support while students are enrolled in introductory college-level math and English (also called gateway courses), allowing more students to access and complete such courses in their first year of college enrollment (Ran & Lin, 2022). While studies of corequisite remediation suggest that many students can be successful when granted immediate access to college-level coursework (Logue et al., 2016; Logue et al., 2019; Mejia et al., 2019; Miller et al., 2022; Park-Gaghan et al., 2021), best practices for implementation have yet to be fully realized. Indeed, as states and systems begin to implement corequisite course models at scale, important questions face the field, including how colleges navigate the transition from prerequisite to corequisite support, which factors facilitate or hinder scaling, and how implementation choices shape faculty, staff, and student experiences.

In the fall of 2019, the City University of New York (CUNY) Office of Academic Affairs (OAA) provided colleges with updated guidance for designing and delivering evidence-based corequisite remediation and set a timeline for the phaseout of traditional, standalone remediation by fall 2022. CUNY OAA's guidance included a limit on contact hours and requirements for college credit awarded but did not impose a single course model for corequisite design; rather, the policy allowed individual colleges to determine how best to offer corequisite courses on their campuses. Given that institutions were not required to follow all criteria and had different implementation timelines prior to the system-wide shift, corequisite course models in CUNY exhibit variation across colleges, providing a rich context to explore how institutions designed and scaled corequisite courses.

At the start of 2023, the Center for the Analysis of Postsecondary Readiness (CAPR) began a partnership with CUNY on a research study exploring the first year of full-scale implementation of corequisite courses in the CUNY system. By examining how different CUNY colleges managed the transition to fully scaled corequisite courses and structured their

corequisite courses and the implications of those choices for early implementation, this research aims to grow the field's understanding of factors critical to the implementation and scaling of corequisite courses, including how students, faculty, and staff are experiencing the change. The research was designed in two phases: The first phase focused on the experiences and perceptions of faculty, administrators, and staff, and the second phase focused on corequisite classrooms and the experiences of students in varied reform contexts. This report presents findings from the first phase.

The growing national adoption of corequisites offers at least two lessons. First, as more colleges and systems adopt and evaluate corequisites, we learn how models contribute to student success. Second, we learn how colleges and systems manage institutional change, navigate complex reforms, and redesign processes for academic support. CUNY offers a useful case study opportunity due to the size and complexity of the system and the diversity of its students; also, having moved from offering lengthy prerequisite developmental sequences with challenging exit requirements to scaling corequisites, it presents an impressive example of transformation. Tracing the change process in CUNY, this report offers lessons for other systems and colleges seeking to expand and scale corequisite courses.

In this report, we first discuss the setting, sample, and data for the study and then provide an overview of corequisite course structures, popular models, and adoption and scaling nationally. Next, we describe the CUNY OAA and system leaderships' efforts to support the adoption, expansion, and scaling of corequisites system-wide, after which we review the features of corequisite models on CUNY campuses. Next, highlighting the experiences of colleges in the study, we turn to factors that facilitated or hindered the implementation and scaling process, followed by faculty and staff experiences with corequisite courses. We conclude with a discussion of considerations for other colleges, systems, and states undertaking the expansion and scaling of corequisite courses.

2. Study Background

CUNY is the largest urban public university system in the country. Its ten associate-degree-granting colleges (including its seven community colleges) span the boroughs of New York City and enroll about 122,000 students per year. The population of its community colleges includes 85 percent students of color, 66 percent Pell Grant recipients, 65 percent students neither of whose parents completed a college degree, and 38 percent foreign-born students (CUNY Office of Institutional Research and Assessment, 2020).

In the winter of 2023, researchers collaborated with CUNY OAA staff to invite all ten associate-granting colleges to participate in the study. Seven colleges volunteered to participate, of which five are community colleges and two are other associate-granting colleges (i.e., they offer both baccalaureate and sub-baccalaureate degrees). We refer to these as Colleges 1–7 throughout the report. At each of the participating colleges, research staff conducted hour-long Zoom interviews and, in a few cases, focus groups with faculty and staff who played a role in the design and implementation of corequisite courses, including academic and student success administrators, math and English faculty members, and college advisors. Overall, for the first phase of data collection, we spoke to 68 individuals across the seven colleges; the number of people we spoke to per college ranged from 7 to 14. Additionally, we interviewed three members of CUNY OAA staff who played significant roles in the formation of developmental education reform policy to support the expansion of corequisite courses in the system.

Recordings of and notes from interviews and focus groups were the primary data sources for this report. Additionally, we drew on college websites, archived catalogs, and descriptive data on corequisite course characteristics and enrollment rates provided by CUNY OAA.

The reader should keep in mind that this report represents a preliminary look at the first year of full-scale corequisite implementation and is based on discussions with selected groups of college stakeholders, which may not reflect the experiences or perceptions of everyone at the colleges.

3. Overview of Corequisite Courses

In recent years, there has been increased national interest in implementing corequisite courses as a reform to the traditional system of multi-semester prerequisite developmental education courses. Students who are placed in corequisite courses enroll directly into college-level courses with corequisite supports—such as in-class tutoring, online learning labs, or a supplemental class— rather than first taking noncredit-bearing developmental courses. Several studies have shown that granting students access to college-level courses via corequisite courses leads to better student outcomes (Bickerstaff et al., 2022; Logue et al., 2019; Miller et al., 2022). The positive results from these studies have influenced many states and colleges that have shifted to corequisite courses, with the goal of better helping incoming students complete gateway college-level math and English courses. Corequisite support is currently required or allowed in 24 states (Whinnery & Odekar, 2021); however, only a handful of states—California, Florida, Georgia, Kentucky, Louisiana, Nevada, Tennessee, and Texas—have fully scaled corequisites and discontinued the use of prerequisite remediation for nearly all students. Despite evidence that corequisite courses produce stronger outcomes for students than prerequisite courses, many educators contend that corequisites are not an appropriate model for all students, particularly those with very weak academic preparation upon college entry (Williams, 2024).

There is a wide array of approaches to corequisite course design. Under the two-course model, students enroll in designated sections of the introductory college-level course as well as in a 1–3-unit linked support course designed to provide instructional support for the college-level course. Under the one-course model, students receive additional support by enrolling in a version of the introductory-level course with more contact hours (e.g., a 3-credit/4–6-contact-hour course rather than a 3-credit course with 3 contact hours). In some cases, corequisite course sections are linked to the college-level section and taught by the same instructor. In others, students have the choice to enroll in any available section of either course. In some approaches, the college-level course comprises "on-level" and "developmental-level" students; in other approaches, the college-level course enrolls only students referred for corequisite support. Corequisite supports may be structured as a course or as a learning lab and may be offered in person or online (Bickerstaff et al., 2022). Evidence is still emerging about which model configurations (e.g., one-course vs. two-course models) or combinations of configurations (e.g., two-course models taught by the same or different instructors) contribute most effectively to student success (Bahr et al., 2022; Denley, 2018; Park-Gaghan et al., 2021).

There are several popular "off-the-shelf" models for corequisite courses that often integrate corequisite structures with changes to curriculum and pedagogy, some of which were

adopted by CUNY colleges. In math, math pathways are sometimes implemented in conjunction with corequisites. The math pathways approach seeks to align the content of corequisite courses to students' major pathways; thus, students in STEM majors take algebra-based corequisites, and students in social sciences or humanities majors take corequisites in statistics or quantitative reasoning. In their evaluation of Tennessee's corequisite courses, Ran and Lin (2022) found that math pathways were a significant driver of success in gateway math completion.

The Charles A. Dana Center and The Carnegie Foundation for the Advancement of Teaching have both developed versions of math pathways models that can be used in corequisites. The Dana Center's model is Dana Center Math Pathways (DCMP), and Carnegie's two models are Quantway, a quantitative reasoning course, and Statway, a statistics course. These models take similar approaches. Both integrate foundational math content with real-world applications and contextualized problem-solving tasks. Both also emphasize active learning experiences and collaborative problem-solving activities to engage students and help them develop a deeper understanding of mathematical concepts.

In English, the Accelerated Learning Project (ALP) model developed at the Community College of Baltimore County has gained traction nationally and within CUNY. More of a course framework than a curriculum, ALP is a two-course model whereby students who qualify for corequisite English take an introductory college composition course and a support course for an additional number of hours per week. The introductory college composition course enrolls both students who require corequisite support and those placed at the college level; the support course enrolls only students deemed not proficient in English. Enrollment in the composition course is limited to 24 students, and a maximum of one third of them are considered non-proficient. The course enrollment caps are intended to facilitate relationship building between students and faculty, allow for more personalized instruction, and empower students to seek help in the support section.

Research shows that regardless of the model, in comparison to prerequisite courses, corequisites increase the rate at which students complete gateway courses and the rate of college-level credit accrual in the first year of enrollment. While some studies have shown positive impacts on longer term outcomes such as performance in subsequent college-level courses beyond introductory math and English and graduation rates (Douglas et al., 2023; Logue et al., 2019), others have found limited impacts beyond gateway course completion and credit accumulation in the first year of enrollment (Kane et al., 2021; Ran & Lin, 2022). Research suggests that implementing corequisites with complementary changes to curriculum and pedagogy may have the biggest impacts on student performance (Bickerstaff et al., 2022). Thus, the processes that colleges undertake as they adopt corequisites, design approaches to curriculum and pedagogy, and provide professional development to prepare faculty to deliver the courses effectively are critical to their impacts

4. Transition to Corequisites in CUNY

In this section, we explore how CUNY OAA sought to guide colleges to experiment with, expand, and ultimately scale corequisites. Notably, the OAA provided colleges with flexibility in the use of models so that individual colleges would be free to design their corequisites to meet the distinct needs of their campuses and students.

At the beginning of CUNY's process of experimentation with corequisite courses, many colleges in the system offered long sequences of prerequisite remediation with demanding exit requirements, and few students were able to meet institutional benchmarks of college readiness. For example, prior to 2016, system-wide pass rates in exit-level remedial math courses were consistently around 40 percent. Over the course of a decade, however, as a result of actions taken by CUNY OAA, researchers, and individual CUNY campuses, the system changed the process for placement into developmental support, eliminated exit exams and ultimately prerequisite remediation, and fully scaled corequisite courses.

CUNY's transition to corequisite courses was centrally mandated. CUNY OAA and system leadership played a critical role in the transition by sharing data and information on developmental education and corequisite reforms across the system, providing financial support for corequisite course development, facilitating communication between CUNY OAA and colleges, and issuing policy guidance. In what follows, we draw on interviews with OAA staff members who described their perceptions of critical junctures in the transition. Figures 1 and 2 below illustrate the timeline of implementation among the study colleges and the timeline of efforts by CUNY OAA and the system leadership to support the adoption and scaling of corequisite courses beginning in 2013.

Figure 1. Corequisite Implementation Timeline:

English & Math Implementation by College and CUNY Milestones

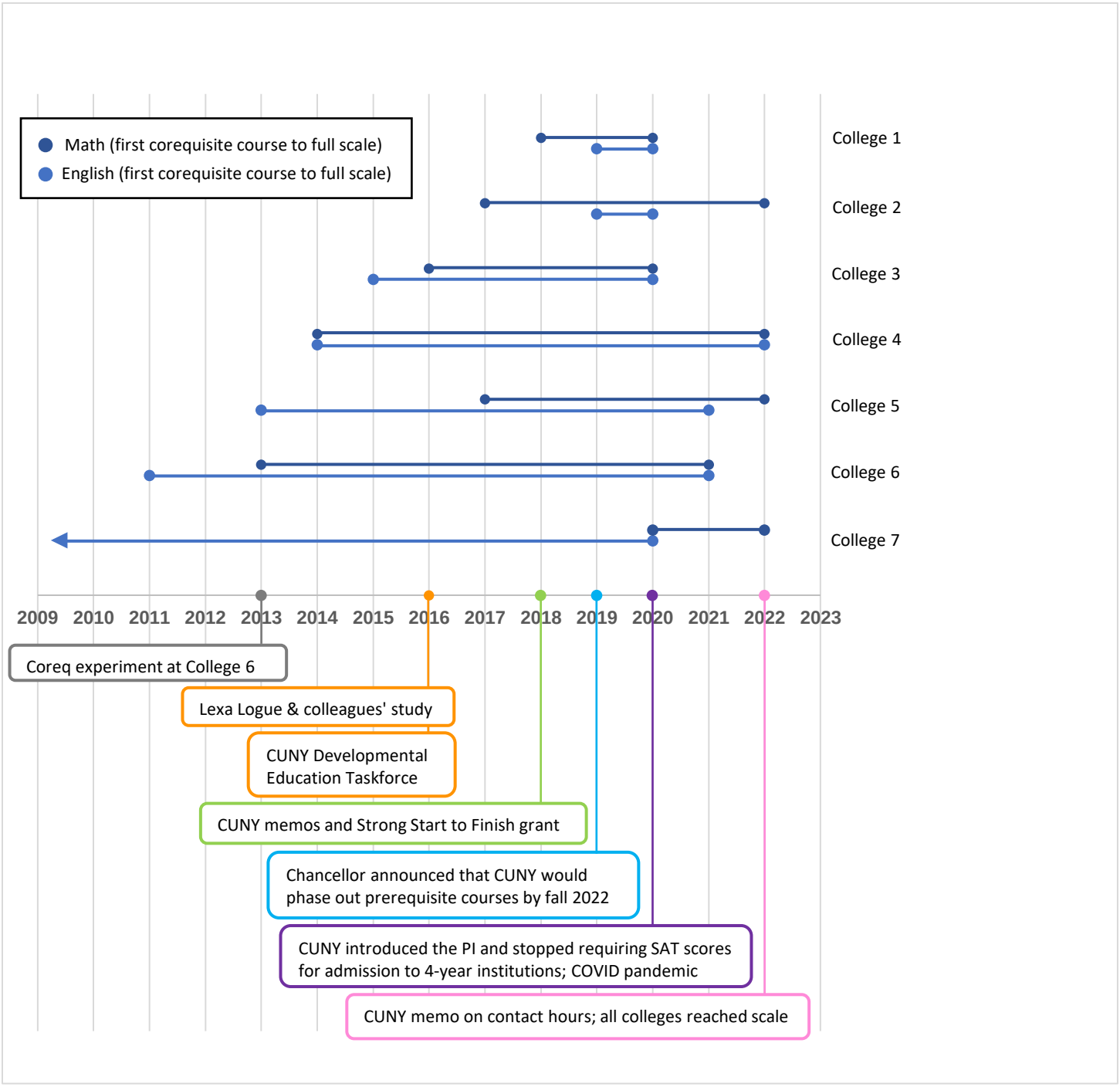
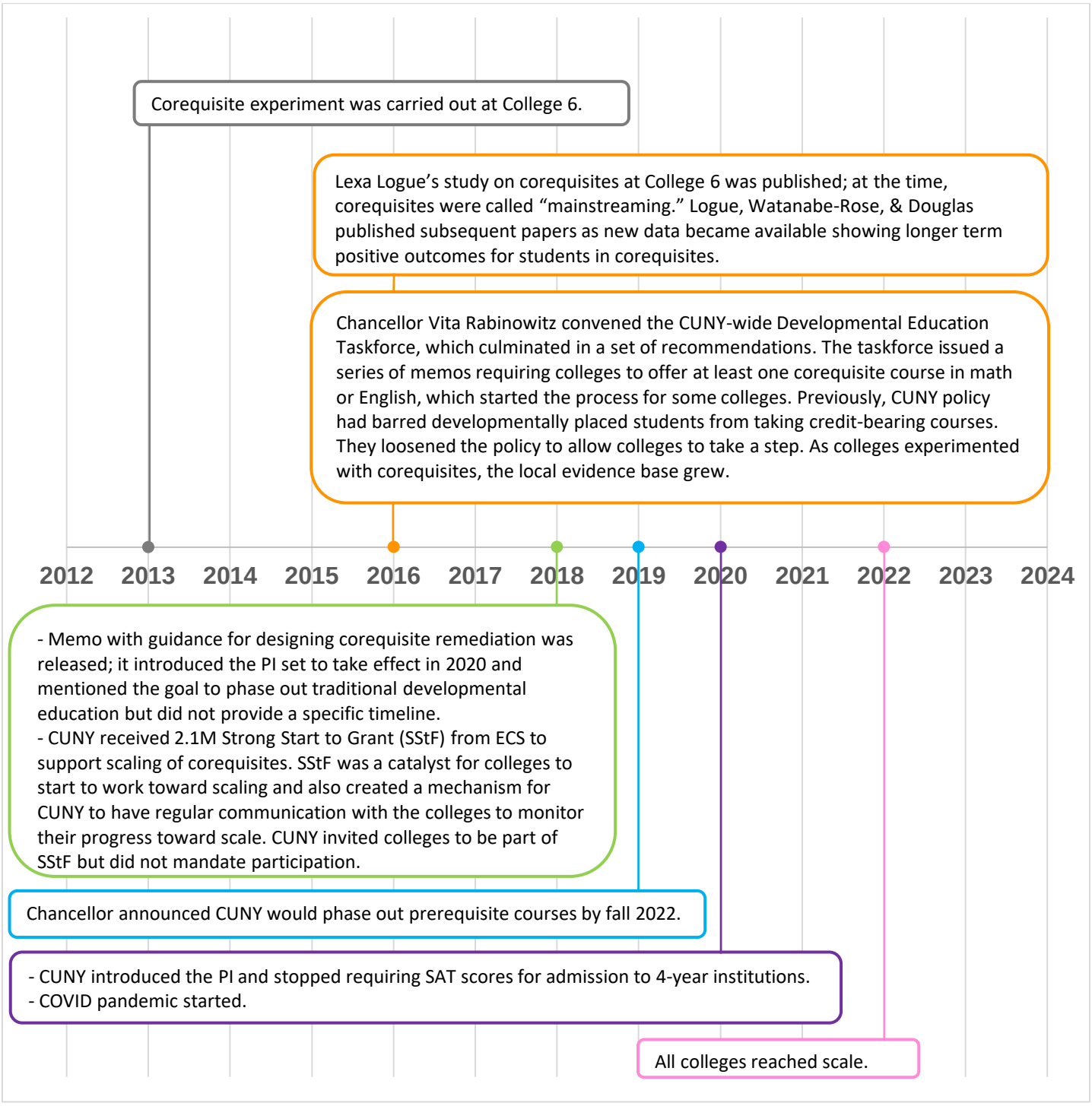


Figure 2. Timeline of Important CUNY Events Related to Corequisite Implementation



OAA and Leadership Timeline to Support Scaling of Corequisite Courses

Laying the Groundwork

In 2013, Lexa Logue, Mari Watanabe-Rose, and Dan Douglas began a study exploring the efficacy of corequisite courses in math at College 6. Logue, a former executive vice chancellor and university provost of the CUNY system, and colleagues conducted a randomized controlled trial to examine the efficacy of what was then called mainstreaming students into credit-bearing courses. Specifically, the study compared outcomes for students taking prerequisite remedial courses in algebra with those of students taking credit-bearing statistics courses, which used Carnegie's Statway model. First published in 2016, the study found positive outcomes on course pass rates, one-year credit accumulation, and year-to-year persistence for students in corequisite courses (Logue et al., 2016). Emphasizing the importance of the study for catalyzing the transition to corequisites, an OAA staff member said, "I think [the study] was very powerful because it's such strong evidence in exactly the same policy environment that we were asking everybody else to act in." The research played an important role in building a local evidence base showing the efficacy of corequisites at CUNY colleges. Additionally, because the authors tracked students longitudinally, updates were released in 2019 and 2023 that demonstrate the long-term positive impacts of corequisites (Douglas et al., 2023; Logue et al., 2019).

Encouraging Initial Adoption

In 2015, Executive Vice Chancellor and University Provost Vita Rabinowitz convened a CUNY-wide Developmental Education Taskforce consisting of department chairs, chief academic officers from several CUNY colleges, and members of the OAA staff to examine developmental placement and exit policies, as well as course formats, curricula and pedagogy, and promising emerging strategies for improving student outcomes. In 2016, the Taskforce published a report that encouraged colleges to adopt corequisite models of remediation for associate-seeking students (CUNY Taskforce on Developmental Education, 2016). The Taskforce's recommendations affected other notable changes to, for example, placement and exit requirements for developmental education. In 2020, a new centrally administered placement algorithm was introduced that used high school grade point average (GPA) and standardized test scores (from the SAT and New York State Regents exams) to determine assignment to developmental interventions. Additionally, the use of exit exams in developmental math and English to determine proficiency for college-level courses was discontinued in 2016.

Following the release of the Taskforce report, Rabinowitz issued a series of memos requiring associate-granting colleges to offer at least one corequisite course in math or English. Previously, CUNY policy had barred developmentally placed students from taking credit-bearing courses. The Taskforce recommendations coupled with Rabinowitz's policy memos loosened policy requirements and pushed colleges to experiment with corequisites, producing more local data on the effects of corequisite course-taking. An OAA staff member noted that, to OAA staff's surprise, once policy allowed for corequisite courses, more colleges opted to expand their corequisite offerings.

In 2018-2019, CUNY OAA issued a series of memos offering guidance on the design of corequisite courses. These memos covered topics such as course models, criteria for passing corequisites, credit hours, credits awarded, and billing. The memos introduced mandatory design elements—referred to as overarching principles—as well as recommendations for best practices. The overarching principles included the "just-in-time" integration of foundational content, which means that rather than simply combining a remedial course and a credit-bearing course, corequisites must be designed to integrate foundational topics when needed to support the learning of college-level topics. The overarching principles stipulated that curriculum focus only on topics essential for subsequent college-level courses, thus encouraging faculty to pare down the amount of material covered. It was also required that the college-level courses associated with the corequisite be equivalent to the standalone course with identical learning outcomes, assessments, and assignments. Moreover, guidance on contact hours limited the number of hours to two more than the associated college-level course. Prior to 2019, CUNY OAA believed that they lacked adequate evidence to mandate a limited number of hours; consequently, courses developed by early adopters often carry more contact hours, and courses developed later carry fewer. Finally, the memos stipulated that corequisites be available to students with profound as well as light developmental need. Subsequent updated memos included guidelines for student placement with the forthcoming introduction of the placement algorithm in 2020.

Moving Toward Scale

For the period 2017–2021, CUNY received a grant for $2.1 million through Strong Start to Finish (SStF) via the Education Commission of the States to support the scaling of corequisite courses. In 2017, CUNY also began receiving $2 million in annual allocations from the City of New York, which funds CUNY's community colleges, to support developmental education reform. From 2017-18 to 2021-22, these funds totaled $9 million. During this period, all associate-granting colleges offered some corequisite courses in math and/or English, but none had scaled them. CUNY used SStF funds to pay for 2–3 terms of course release for faculty leads; this time was intended for developing corequisite curricula

and materials and, importantly, for training other faculty to implement the courses to enable scaling. The SStF grant also paid for stipends for faculty participation in this training. An OAA staff member said that because colleges had different timelines for the adoption of corequisite courses (with some colleges having developed courses and professional development in prior years), the quality and intensity of professional development varied. All ten associate-granting colleges participated, and the funds were divided between them. In addition to funding for the development of corequisite courses, OAA staff noted that the SStF grant provided a mechanism for regular communication between CUNY OAA and the participating colleges to monitor colleges' progress toward scale. This laid the foundation for establishing a deadline to completely phase out prerequisite remedial courses. At a CAPR conference late in 2019, the new executive vice chancellor and university provost, José Luis Cruz, announced publicly that CUNY would scale corequisite courses by the fall of 2022.

Following the onset of the COVID pandemic, the CUNY system closed in-person operations in March 2020. As was the case with community colleges nationally, the pandemic led to massive enrollment declines for CUNY as well as a complete shift to online teaching and learning. Further, as a result of the upheaval, the CUNY system stopped collecting SAT/ACT scores for admission to its senior colleges; this change led to enrollment shifts in the system with implications for the implementation of corequisite courses that will be discussed at the end of this report.

In light of the impacts of the pandemic on students and colleges, OAA staff considered revising the timeline for scaling but decided not to. The decision to follow the original timeline was motivated by the fact that colleges had made significant progress, and OAA staff believed that it was still feasible to complete the work by fall 2022. Confidence was bolstered by the fact that several colleges had fully scaled corequisite courses by 2020. As one OAA staff member remarked, "People proved it could be done despite COVID screwing up the world." Further, the administration feared that pushing back the scaling deadline would encourage colleges to spend time developing online versions of prerequisite courses, which would soon become obsolete.

By the fall of 2022, all CUNY associate-granting colleges had fully scaled corequisite courses. This marked the culmination of over a decade of experimentation with and expansion of corequisite courses at CUNY. The key facilitators of scaling, according to CUNY OAA staff, were the long timeline for rollout, grants and money provided by New York City to support course scaling, continuous sharing of data on the effects of developmental education and corequisites on student success, and a policy environment that allowed colleges to adopt and expand corequisites as evidence of their efficacy grew.

Key Features of Corequisite Models Across CUNY Colleges

CUNY OAA's guidance on the implementation of corequisites gave colleges flexibility to design and implement models according to college contexts and preferences and using different kinds of corequisite course structures, an approach used in other states with large community college systems, such as Texas (Daugherty et al., 2018). While the OAA's policy approach aimed to foster variation in models across the colleges, this flexibility did not result in as much variation as anticipated.

In English, five of the seven colleges in the study adopted the Accelerated Learning Project (ALP) framework developed at the Community College of Baltimore County (CCBC). English faculty described efforts to model their corequisites very closely on the ALP, including integration of college-level and corequisite students, the use of a single instructor teaching both the college-level and support sections of the course, and enrollment caps to foster relationship building. The non-ALP English courses are characterized by college-level and support course sections and the integration of foundational topics throughout the course; however, unlike the ALP model, these models do not integrate college-level and corequisite students.

In contrast, CUNY colleges did not gravitate toward any established model for math, though as previously mentioned, College 6 adopted Carnegie's Statway model. Consequently, the math corequisites display fewer common features across colleges. These common features include a one-course model integrating college-level and corequisite material in a just-in-time approach whereby students' foundational knowledge and skills are reinforced as needed to learn college-level content. Additionally, all colleges offer corequisite courses in different math pathways (e.g., college algebra, statistics, quantitative reasoning). However, interviewees noted challenges developing and maintaining enrollment in non-algebra-based courses, which is described in greater detail later in the report.

There were also some common approaches taken across disciplines, which we detail below. A theme underlying these approaches is a desire to design courses to adequately support students with a wide range of proficiency levels. For additional details on model features at the sample colleges, please see Appendix A.

Embedded Tutors

About half of the colleges in the study sample included embedded tutors as a part of their corequisite models. Tutors are typically students who performed well in math and English courses previously and are embedded into the classes to provide additional support to students, primarily during class time. Research conducted on the impact of embedded tutoring in corequisite English courses in Texas suggests that it can have a minor impact on

improving students' academic outcomes but also finds that students made minimal use of the tutors in their corequisite courses (Ganter, 2022).

Contact Hours

The number of contact hours associated with the corequisites varies from a low of five to a high of eight. As noted, CUNY OAA released guidance in 2019 limiting the number of additional contact hours to two more than that offered in the associated college-level course. For example, if the college's existing college-level algebra course were a four-contact-hour course, the corequisite algebra course could total no more than six contact hours. However, courses developed prior to 2022 were allowed to carry a higher number of additional contact hours. Recent research on the effects of different corequisite models suggests that fewer contact hours may produce stronger student outcomes than more contact hours (Bahr et al., 2022; Denley, 2018; Park-Gaghan et al., 2021).

Models Designed for Higher Performing Students

There is a widespread perception among CUNY faculty and staff that current corequisite models were designed for students with higher levels of preparedness and that models appropriate for students with more profound support needs are lacking. Indeed, interviews revealed that most initial corequisite models combined the highest-level remedial course in the sequence with the college-level course.

Instructor Autonomy in Support Sections

Many faculty highlighted the considerable instructor autonomy they were given to teach the support sections of the corequisite courses in ways they deemed responsive to student needs. This flexibility in how instructors structured the support courses was also observed at the four colleges across Minnesota and Texas that participated in the Charles A. Dana Center's Corequisite Research Design Collaborative (CRDC) study, which shows that instructors adapted support courses based on the content that students needed to review. Some instructors would also use their class time to assess how well students understood the content introduced in the college-level course (Cerna et al., 2023). Instructor autonomy appears to be important as it gives instructors flexibility with the pedagogical practices they use in the classroom, and previous research on corequisite courses has shown that faculty's pedagogical approaches and mindsets about their students—specifically, the use of asset-based practices in the classroom—are critical to student success in these courses (Hernández, 2023).

Delivery Modality

Most colleges offer the vast majority of corequisites either in person or in online synchronous formats due to the belief that online and particularly asynchronous formats are not conducive to success for corequisite students.

Factors Critical for Supporting the System-Wide Transition

Interviewees from OAA observed that the long timeline for experimentation, adoption, and scaling was an important facilitator of the transition, particularly because the system did not provide a lot of policy guidance on model design or mandate that colleges meet specific expansion milestones in the scaling process. A long timeline allowed for building of local data on the efficacy of corequisites in CUNY colleges and helped CUNY OAA learn what aspects of course design contributed to student success—information that OAA used to update policies over time. Emphasizing the importance of evidence in the process, one OAA staff member reflected,

> We were never forcing someone to do something that we couldn't support strongly with the evidence and data that we had. We've talked a lot about how our evidence grew over time, and as our evidence grew, we were able to remove some of the [policy] flexibility because we were able to justify it. So, the pro [of a longer timeline] is we never had to step too far out on a limb ourselves to require something we couldn't fully support.

A notable aspect of CUNY's approach to corequisites is the flexibility that the OAA allowed colleges for model selection, which one staff member described as a double-edged sword in the scaling process. OAA staff identified several motivations for this approach. At the beginning of the process, there was little evidence about the impacts of different corequisite models to support policy guidance. Additionally, OAA staff believed that allowing flexibility would foster variation in models across colleges that OAA could then study, and they wanted colleges to have a sense of ownership over their course design. An OAA staff member summed up the approach: "So, we were really hands-off about specifying models and really encouraged colleges to be led by their own faculty or their own assessment of student needs." In this person's view, the hands-off approach led to a slower scaling process than what might have occurred had there been more centralized control and did not ultimately lead to as much variation in course models as OAA anticipated.

Leadership changes, which are common in higher education, often result in shifts in institutional priorities that can slow or stall ongoing reform efforts. Therefore, another

important feature of CUNY's transition was that, despite role turnover, multiple university leaders championed developmental reforms and created policy conditions that enabled experimentation and later encouraged adoption and expansion of corequisites. It was critical that these new leaders reaffirmed the importance of the goal to phase out prerequisite remediation, particularly during the upheaval of the COVID pandemic.

5. Factors Facilitating Implementation and Scaling

Mandate

For many colleges, particularly for math departments, the CUNY OAA mandate to scale corequisite courses catalyzed experimentation with and expansion of corequisite courses. While many faculty we interviewed noted that they were aware of and concerned by the poor student outcomes in traditional remedial courses, they nonetheless were often hesitant to adopt new strategies or lacked consensus on the best strategy to adopt. An administrator at College 2 described this sense of inertia:

> For years, we were very disturbed by extremely low pass rates [in developmental education]. There was a stagnancy to the environment, and we felt it was a moral imperative to make a change. There was quite a bit of pushback from the folks in charge of [developmental education], so the CUNY [corequisite] mandate really helped us make the needed changes.

Relatedly, an administrator at College 5 observed that "only with a board policy would we have ever moved in this direction." The administrator explained that CUNY OAA's management of the policy mandate was a facilitator in the transition for the college. In this person's view, CUNY allowed for a long timeline for the transition, provided sufficient money for course redesign and professional development, and balanced the policy mandate with offers of support. Research on corequisite course implementation in other states with similar mandates presents comparable findings: While the mandates helped to accelerate scaling across the states through changes to course structures, multiple challenges arose across institutions because stakeholders felt they did not have the necessary information or time to prepare for these changes (Pepin, 2022).

Grant Money

The implementation of corequisite courses involved significant costs for colleges. Across the colleges, faculty and staff acknowledged that grant funding was a key facilitator that often supported the initial development of corequisite course syllabi, curricula, and materials; allowed time for faculty reflection, feedback, and improvements to course models in the piloting phase; and supported professional development for faculty teaching the courses. Funds came from a variety of sources, including SStF, Title V (the Developing Hispanic-Serving Institutions Program), and New York City allocations to support developmental education reform. Colleges that were early adopters of corequisites often drew

on their own sources of funding, while colleges that adopted corequisites in response to the mandate relied more heavily on SStF and city funds. As mentioned previously, SStF funds, which were awarded to colleges beginning in 2019, enabled colleges to offer stipends to faculty to develop curricula and materials.

Professional Development

Professional development (PD) is an important facilitator as it allows faculty to learn about corequisite models and successful approaches for instruction. Additionally, some colleges viewed PD as an important mechanism for building faculty engagement and buy-in for the reforms and for building community among faculty, enabling them to support one another and develop consistent approaches to corequisite instruction. Prior research on developmental education reform suggests that in order for PD to be effective at securing widespread buy-in among faculty, a one-size-fits-all approach is not optimal; instead, PD should be tied to faculty members' perspectives and orientations toward the reform in question (Bickerstaff & Cormier, 2015).

At College 4, the math department chair shared that, despite initial reluctance among faculty to shift to the corequisite model, PD events allowed faculty to learn more about corequisite models' best practices and outcomes, which helped bring more math faculty on board. Similarly, at College 6, math faculty leading the development of corequisites reported using PD to give faculty a role in course development. A math faculty member at College 6 explained:

> It is important to have faculty buy-in—you want people to be willing to teach the course and to be enthusiastic about it so their students can tell they're enthusiastic about it. And professional development can help a lot with that, if you do it right. A big part of that is to kind of provide a group ownership of the course. The professional development seminars that we were doing focused on looking at the current course design and collecting feedback from the faculty involved and doing collaborative course design so that people could feel like they were given a chance to weigh in on the course and to have a little bit of ownership of the process and of the course itself.

Similarly, at College 1, an English faculty member said that the most valuable outcome of PD was the dialogue it facilitated among faculty and the community of faculty participants it fostered. However, not all faculty found PD useful. One math faculty member deemed PD opportunities offered by CUNY OAA and the college "pointless." This faculty

member maintained that faculty had the necessary experience and expertise to instruct effectively, but their ability to support student success was constrained by the limited number of contact hours for instruction in the corequisite courses. Research on variation in faculty orientations to instructional reform suggests that they are contextual and "formulated in reaction to specifics of the proposed change," which can vary across English and math disciplines (Bickerstaff & Scaling Innovation Team, 2014, p. 3). For example, an English faculty member may believe that students are prepared to take college-level English in the first semester, while a math faculty member may believe that students require additional levels of coursework to be prepared for college-level math. Ultimately, shifting faculty orientations to engage in reform efforts requires them to believe in the benefits of the proposed changes and feel supported in making these changes (Bickerstaff & Cormier, 2015).

The intensity, structure, and focus of PD to support corequisites varied across the colleges. In general, PD opportunities were often more abundant when courses were initially developed and piloted, although many colleges offer ongoing corequisite-focused PD. Additionally, many colleges used initial PD to develop a repository of resources, such as syllabus templates and other course materials, that are now available to all faculty.

National research on corequisite course implementation highlights the importance of PD, especially when offered at the institutional level, for overcoming challenges to fostering faculty engagement and for consistently implementing reforms at scale. Examples of useful PD include national conferences and trainings provided by experts on the ALP model, as well as state-funded PD meetings (Daugherty et al., 2018). The PD model for CUNY Start, a pre-matriculation program to improve student readiness, leverages instructional expertise through an apprenticeship for new teachers who learn from and observe lead teachers in order to become well-versed in the curricula and pedagogy; this kind of faculty-led professional development approach can be a critical component for enacting high-quality instructional approaches (Cormier & Bickerstaff, 2020).

Pre-Matriculation Programs

The existence of CUNY pre-matriculation programs facilitated the adoption of corequisites at some colleges, as they provided a pre-curricular option for students with low placement scores that many faculty believed was important to maintain. Pre-matriculation programs include the intensive Math Start/CUNY Start (MS/CS) program and the less intensive University Skills Immersion Programs (USIP) offered by colleges (typically as several week-long summer intensive courses) that are designed to help students assigned to developmental education get up to speed in math and English and then enroll in credit-bearing courses. CUNY Start has been found to produce positive student outcomes relative to traditional remediation, including increased student college readiness, credit accumulation,

and graduation rates (Weiss et al., 2021). These programs are free (USIP) or of very low cost to students (MS/CS); however, they are often time intensive, and many students do not want or are unable to participate in them during the summer. According to CUNY's open admission policy, colleges cannot require students to complete pre-matriculation programs, which some faculty and staff find frustrating. However, advisors and faculty at many colleges in the sample said that they strongly encourage students assigned to developmental education to participate in pre-matriculation programs, though they also noted that given the alternative of a corequisite course, many students would choose not to participate in pre-matriculation programs.

Leadership

The stability of college leadership and their receptivity toward corequisite courses were important facilitators of or hindrances to adoption and scaling. The presence of corequisite champions among college presidents, academic administrators, and chairs often facilitated early adoption and faster expansion. At College 5, for example, English faculty noted that the college leadership had supported both the shift to corequisites and course features like continuity of instruction and enrollment caps that faculty deemed critical to the model's success, though they made implementing the model more costly. However, an academic administrator said that within the CUNY governance structure, department chairs have "an incredible amount of authority over their curriculum and departments," making it very challenging for administrators or even presidents to overrule chairs who were not receptive to corequisites. Moreover, instability in leadership could create barriers. At College 1, English faculty said that turnover impacted the development of the English corequisite because new academic administrators charged with approving the corequisite model often did not understand the value of features of the model that faculty considered critical for its success. While institutional leadership can be one of the most important facilitators of change, these findings underscore the importance of having additional "change agents" who are advocating for change across the institution (Kezar, 2018). Kezar (2018) also emphasizes the need for *collective* and *shared* leadership, whereby multiple stakeholders are involved in the change process from both the top and the bottom of the institutional hierarchy.

6. Factors Hindering Implementation and Scaling

Difficulty Disentangling Effects of Placement Changes, Scaling Mandate, and Pandemic

A major concern across colleges was that the implementation of the placement algorithm, the mandate to scale corequisites, and the pandemic-induced shift to online instruction occurred roughly simultaneously, which made it hard to determine how any one of these factors may be contributing to changes in student success in gateway English and math courses or to identify solutions for poor pass rates. An academic administrator at College 5 summed up the lack of clarity about the cause of declining pass rates in gateway courses: "Is it that our faculty haven't embraced the concept, or is it that students truly are not prepared because of COVID? Or is it that the course is not structured correctly? I think we have a lot to untangle here." Research on multiple measures assessment (MMA) and corequisite course scaling across different states demonstrates how concurrent institutional reforms can present challenges in discerning the specific impacts of each reform, especially as the use of both MMA and corequisite courses is increasing rapidly at institutions across the country (Litschwartz et al., 2023).

Many colleges reported declines in pass rates in gateway English and math courses in both corequisite and college-level courses since scaling. Research has examined such declines in the wake of corequisite reforms. As Morse (2020) describes, California eliminated developmental education requirements through AB 705, which led to an aggregate increase in the number and percentage of students who had passed a gateway course within their first year. However, a far larger percentage of students who enrolled in the gateway courses failed them. Put differently, among the students whose enrollment was shifted from developmental education to corequisite remediation, some passed the gateway course (leading to higher gateway course completion rates among beginning college students), but a large portion of them did not (leading to higher gateway course failure rates among students who enrolled in gateway courses).

Skepticism About Accuracy of Placement Algorithm

Faculty, administrators, and staff all expressed concerns about the accuracy of the new placement algorithm. For example, College 2 faculty described it as "very chaotic," "certainly very fallible," and "not proving to be a predictor of student success in these courses." The placement algorithm, which has been described by interviewees as a less transparent measure of student preparedness (compared to previous placement procedures), makes it difficult for faculty members and advisors to understand students' specific needs

and place them in the appropriate course. Interviewees also commonly reported doubting that the new placement process adequately serves the specific population of students at their college. In the words of one College 5 math faculty member, "[The new assessment] is not effective for our population." Across colleges, faculty expressed concern that students lack Regents or SAT scores, especially in the wake of the pandemic, and that consequently the algorithm is not actually using multiple measures to place students; instead, it relies on high school GPA, which may vary greatly between high schools or be difficult to interpret for international students. It is important to note that MMA research shows high school GPA to be one of the best predictors of college success and that the placement algorithm is designed to base the large majority of the final placement value on high school GPA (Barnett et al., 2018; Cullinan et al., 2018). A consequence of the perceived shortcomings of the new placement algorithm is a concern that students in corequisite as well as in college-level courses represent a wider range of proficiency levels, which presents teaching challenges.

Challenges in Shifting Course Delivery Models

Several colleges reported that the shift to online instruction has negatively contributed to students' success in corequisite courses. Many faculty reported not believing online courses are appropriate for remedially placed students as such students benefit from the structure and direct engagement of in-person, classroom-based instruction. Prior to the pandemic, many colleges offered no or a limited number of online remedial or corequisite courses. Thus, at the start of the pandemic, faculty often lacked the experience or training needed to teach online effectively, and colleges often lacked infrastructure to support online teaching or learning. For example, English faculty at College 6 said that many students struggle with unreliable Internet access and limited knowledge of platforms like Blackboard and that they did not turn on their cameras during class and often, faculty believed, joined class while engaging in other activities. Post-pandemic, colleges are attempting to transition back to offering predominantly in-person courses; however, students may be drawn to the flexibility of online courses, and online sections fill quickly. Choices about course modalities must strike a balance between faculty and student preferences as well as the formats that faculty and administrators believe maximize students' prospects for success.

Issues With Advisement Into Corequisite and Math Pathways

Although all colleges offer statistics and quantitative reasoning courses in addition to college algebra— all three of which satisfy math requirements in most non-STEM majors— advisors remain hesitant to advise students into non-algebra math courses. Math faculty noted that advisement related to the corequisite courses has been problematic. At College 5, advisors tend to place students into algebra-based math pathways even when their majors do

not require it. One math faculty member, who had examined the data on this issue, claimed that up to 35 percent of the students in Introduction to Mathematics with College Algebra are liberal arts majors who should have taken the corequisite for non-STEM majors. Similarly, at College 1, the math department developed a corequisite, Nature of Mathematics, for non-STEM majors, but the course is no longer offered due to low enrollment. A student affairs administrator said that Nature of Mathematics was misunderstood by advisors, making them unlikely to advise students into the course. Consequently, the course was often canceled, and enrolled students are now put into the STEM pathway corequisite. A College 3 math faculty member reported struggling to implement a corequisite statistics course due to lack of buy-in from advisors, faculty, and students; in the words of this person, although many faculty members believe a statistics course would be beneficial for students, "getting advisors to put students into the course and getting department support to say, 'This course would benefit our students,' has been challenging given the prominence of college algebra." Research on math pathways has found that advisors are hesitant to put students into non-algebra-based math courses due to concerns about whether multiple math pathways courses would transfer to four-year colleges, leading them to continue directing students into algebra courses (Zachry Rutschow et al., 2019).

7. Faculty and Staff Perceptions of and Experiences With Corequisite Courses

Faculty

Perceptions of Reforms

While the level of buy-in for corequisite courses varied across disciplinary affiliations and institutional roles, English faculty overall seemed more engaged in and supportive of corequisite reforms than math faculty. Most English departments began experimenting with accelerated learning approaches earlier, and English faculty often pushed for policy change that would allow more students into corequisites. For example, at College 5, English faculty started developing corequisites in 2013; this was driven largely by composition instructors, who had observed that prerequisite courses created a barrier for students. One faculty member said that the prerequisite courses were "way too hard to pass and strenuous; [they] set the bar too high." In general, English faculty reported positive perceptions of and experiences teaching the corequisites, citing the time freed up for instruction by no longer needing to focus on preparation for the exit exam and increased time for getting to know students and understanding their needs. Of course, this was not universally the case, and some English faculty felt students with severe deficiencies in reading and writing would be better served if they had the option to take a remedial course. For example, at College 3, some English faculty commented that putting lower level students into college-level English is "overwhelming" for the students, with the eventual outcome being that "students are just failing at the college level."

Resistance to Reforms

Math faculty we spoke to were resistant to corequisite reforms for two main reasons: They believed in the efficacy of current remediation practices and were skeptical about the rationale for change. Overall, math faculty in our sample of colleges considered the prerequisite courses a better approach, particularly for less prepared students who might struggle to learn the information they needed to be successful in the condensed course format. Math faculty emphasized that the limited contact hours in the algebra-based courses have been a challenge. One math faculty member noted that there is no shortcut with algebra learning: Students need instructional time to allow for practice and repetition of concepts. Recent research suggests, however, that students who would have traditionally been placed into prerequisite developmental education courses perform better overall when granted access to college-level courses in the first term (Bickerstaff et al., 2022). Evidence also suggests that students with weaker preparation would benefit from targeted and tiered supports, such as

pre-college programs, corequisite support courses, embedded tutoring, and high-touch advising (Bickerstaff et al., 2022).

Feedback from math faculty also reflected a sense that changes to placement and courses occurred without their input. According to an administrator at College 7,

> Math faculty are generally not in favor of the corequisite model … and that's no surprise, to be quite honest with you, because they've been doing things one particular way for a long time. And [they] had this change kind of placed upon them that many of them feel like they've had limited input into.

Many math faculty expressed feeling forced to make changes based on misguided rationales by people with limited understanding of the realities of teaching underprepared students. One College 3 faculty member said, "Faculty don't want to be told what they're doing is wrong." At College 2, faculty were not entirely certain about leadership's rationale for initiating the shift to corequisites and speculated that adoption was driven largely by financial considerations. While interview participants did not clarify what financial considerations might underlie administrators' support of corequisites, this speculation reflects a belief that the adoption and scaling of corequisites may have been motivated by considerations beyond the best interests of students or faculty. This uncertainty further undermined faculty buy-in to the change. OAA staff noted that in a large system such as CUNY, it is hard to communicate with every faculty member. Although OAA staff gave multiple presentations throughout the years and prepared taskforce reports and memos that explicitly outlined the rationales and evidence base for reforms, the main channels of communication with faculty about reforms were through provosts, department chairs, or optional events for interested faculty. Further complications arose from turnover among provosts during the period of transition and provosts' and chairs' many competing demands, especially during the pandemic. Much of the information shared with college-level leaders about the reform plans may not have reached all the affected faculty members, and faculty may have felt uninformed and/or unconvinced about scaling corequisites.

However, not all math faculty believe students are better served by a prerequisite remedial model. For example, math faculty at College 6 argued that the corequisite model facilitates stronger math pedagogy than the prerequisite approach:

> The corequisite is a better structure for how students learn math. The advantage of the corequisite over the prerequisite model has to do with the structure of mathematical memory. As in other disciplines, the ideas and skills that are not used … just disappear. So, you can

> deliver an entire prerequisite course, and then a year later the student remembers nothing. In contrast, in the corequisites, you learn something and experience its consequences immediately instead of waiting a semester for the mathematical consequences to show up.

Research suggests that faculty may have different attitudes toward instructional reforms. Prior research on developmental education reform identifies three kinds of faculty orientation to reform that institutional leaders must understand to garner faculty buy-in and engagement: ready to act, ambivalent, and reluctant to change (Bickerstaff & Cormier, 2015). The ready-to-act faculty are most likely to play a role in launching or leading the reform in its early stages, while ambivalent faculty are neither active proponents nor opponents of the reform, which could reflect their dedication to other professional priorities or a desire to see evidence of the reform's effectiveness. The reluctant-to-change faculty are actively resistant to the reform for a variety of reasons (Bickerstaff & Cormier, 2015). Taking these different faculty orientations to reform into account across the CUNY colleges could allow corequisite course reform leaders to develop more effective engagement strategies that address each of these orientations and secure buy-in and more widespread participation.

Challenge: More Content in Less Time

One of the most common challenges mentioned by English and math faculty is the amount of content they are expected to teach in a single-semester course. One College 2 interviewee described the experience as "trying to fit in one or two years of math into one semester." Similarly, in the words of one College 1 math faculty member, "Sometimes teaching the corequisite course is like having two courses in one, in reality." This person remarked that a syllabus serves as a course guide, but each faculty member must develop their own approach to teach the course effectively; to accomplish this, "you have to have a good strategy for the curriculum. You have to have a good structure. You have to be well organized. You have to be very strategic, and you have to build in your support heavily." Even with the best strategy in place, there is often a rush at the end of the course to cover all the topics.

English faculty highlighted that while corequisite courses include additional face-to-face time with students, the total number of instructional hours is insufficient to help their students develop the reading skills they will need in every course throughout their college experience. The faculty we spoke to struggled to understand how the accelerated corequisite course time frame could adequately support the needs of all students, particularly those who might benefit from traditional developmental education courses' emphasis on developing the

college success skills (e.g., time management, critical thinking, and study skills) necessary for long-term success.

Across the colleges, faculty and staff expressed concerns about student success in algebra-based corequisite courses. At College 5, Introduction to Mathematics with College Algebra has the worst student outcomes of any of the corequisite math courses. Math faculty emphasized that it is extremely challenging to get students with low proficiency scores entering STEM pathways up to speed with a limited number of contact hours. Prior to the scaling of the corequisite courses, STEM-bound students with low proficiency scores at College 5 would have been assigned to 12–16 noncredit hours of prerequisite math before gaining access to college-level algebra. Now, faculty face the same task with six contact hours. Some faculty are failing up to 70 percent of students in Introduction to Mathematics with College Algebra, which compromises faculty morale. An academic administrator noted that the lack of success in this course presents an ongoing obstacle to garnering math faculty buy-in. While it is surely challenging for faculty to fail large numbers of students in corequisite courses, it is also important to point out that prior to the transition to corequisites, only 40 percent of students passed (mostly algebra-based) prerequisite math courses. Thus, high failure rates in introductory math courses are neither a new phenomenon in CUNY nor one specific to corequisites.

Challenge: Greater Demands on Instructors

Several factors interact to place more demands on faculty teaching corequisites in math and English: Corequisites consist of more contact hours, requiring greater investment from faculty for planning and instructional time; the courses serve students with wide-ranging levels of proficiency and cover more content in less time than a two-course sequence in which a traditional remedial course is followed by a credit-bearing course, presenting significant pedagogical challenges; and, potentially as a result of the pandemic, many faculty noted that student attendance is poor and students are disengaged and not convinced of corequisites' value. Consequently, as one College 3 faculty member put it, faculty must serve a "pastoral" function in that they must motivate and follow up with students, which makes the courses unusually taxing. This sentiment has been expressed in the context of other developmental education reforms such as compressed developmental education courses (e.g., integrated reading and writing): Faculty experienced challenges with getting students to understand a large amount of content in a short amount of instructional time and contact hours (Bickerstaff & Raufman, 2017). In our study, an English faculty member shared that the shift away from prerequisite courses and exit exams to corequisites placed much more pressure on faculty to evaluate students' college readiness, leading to stress and anxiety: "But now it's really all on us to decide what students 'need' to be able to do when it comes to reading and writing for their future academic and career 'success.' That's a big ask." At College 1, math faculty noted

that having fewer contact hours to teach students with sometimes significant deficiencies in math knowledge essentially means that faculty must give more to the course: They must be highly motivated, organized, and understanding of students' needs. Additionally, math faculty often volunteer their time outside of class to provide extra instruction for corequisite students.

However, a math faculty member at College 1 stressed that it is possible to facilitate successful outcomes even for students with significant deficiencies: "It usually takes a lot of work, but that doesn't mean that it can't be done. It can. What is needed is for the department and faculty and everybody to work together and support each other so that the students can do exceptionally well."

Challenge: Working With Tutors

While many faculty said that additional academic supports, such as embedded tutors, are needed to facilitate student success in the corequisites given the pedagogical challenges described above, faculty often expressed hesitation about working with tutors. A College 7 administrator articulated a common theme in our interviews: Faculty struggle to share their classrooms. As the administrator explained, "If you're teaching a class, a lot of times you don't want another person there teaching the course. If I'm teaching a course, I'd prefer not to have anyone else there—I want to have a relationship with the students." Several faculty members shared negative past experiences in which they believe tutors had overstepped boundaries or taught students problem-solving strategies faculty had not sanctioned. Moreover, while about half the colleges in our sample have embedded tutors as part of their corequisite models, not all interviewees believe that embedded tutors improve student success, and few colleges have conducted analyses to estimate their impact. Studies done in other states suggest providing extra support for corequisite students can produce stronger outcomes. For example, an Accelerating Recovery in Community Colleges Network brief describes The College System of Tennessee's coaching program, in which assigned coaches support students in corequisites to navigate coursework, connect with campus resources, and explore majors and careers. The system's research on the impacts of coaching for the first program pilot shows positive effects on persistence in college and pass rates in gateway math (The College System of Tennessee, 2024).

Staff

Easier Advising Landscape

Many advisors and student affairs administrators reported that the scaling of corequisites simplified advising because there are now fewer support options to discuss with students, whereas previously there were developmental courses, pre-matriculation options, and some corequisites available. Additionally, the shift to corequisite courses has led to changes in advising conversations with students. One College 3 advisor shared that conversations about registration are much more "hopeful," especially for incoming freshmen who are new to college and may be nervous and embarrassed to learn that they need to enroll in remedial classes. Another advisor emphasized that conversations with students now "end much more positively" because they no longer have to share "bad news" with students about taking solely noncredit-bearing classes.

Concerns About Contact Hours and Scheduling

Advisors and financial aid staff reported being concerned about the high numbers of contact hours associated with the courses and about the burden this might pose, particularly for part-time students and students assigned to corequisites in both math and English. Many entering students must take corequisites in the first term to gain access to program courses and thus face a schedule made up almost entirely of corequisites. As a result of these concerns and others about student success in the corequisites (particularly in math), advisors often recommend that students with low proficiency scores take pre-matriculation immersion courses to address academic weaknesses.

8. Considerations for Scaling Corequisites

As states and systems begin to implement corequisite course models at scale, important questions face the field, including how colleges navigate the transition from prerequisite to corequisite support, which factors facilitate or hinder the scaling, and how the implementation of corequisites at scale shapes faculty, staff, and student experiences. Although this report addresses the scaling of corequisites in a specific environment—a very large, urban college district—we believe that lessons from CUNY may be applicable to a range of contexts. Below are issues to consider when scaling corequisite courses.

Setting Realistic Expectations and Supporting Faculty

Reforms to developmental education have been a major focus within community colleges for over two decades; as a result, many have come to view remediation as the primary barrier to student success. While eliminating prerequisite remediation removes a barrier for students—particularly low-income students and students of color—the transition to corequisites does not guarantee that students will not continue to struggle academically and require academic supports. For example, Ran and Lin's (2022) evaluation of corequisite remediation in Tennessee finds that the shift to a corequisite model itself did not significantly improve student outcomes in the absence of broader math pathways reforms. Systems that have scaled corequisites often observe declines in gateway course pass rates in the immediate aftermath of discontinuing remedial courses and scaling corequisites. Although more students pass gateway courses, courses may also have lower pass rates as more students are given immediate access. Further, as noted in this report, faculty may perceive that corequisite structures place greater demands on them to evaluate student readiness for college-level coursework, cover more material in less time, and teach students with a wider range of proficiency levels.

Because it is challenging to convince faculty and staff of the need to discontinue traditional remediation without overestimating the impact of corequisites, CUNY OAA staff emphasized the importance of nuance when describing the expected student outcomes of corequisites. As one staff member remarked, "It's not a magic bullet. Things may not be fantastically better." And due to the abovementioned demands placed on faculty, they may need additional support throughout the transition. To prepare for this, colleges and systems could design professional development to help faculty hone pedagogic strategies to support struggling students and effectively teach students with various levels of ability, such as leveraging the strengths of more prepared students in group work and developing different assignments. It may also be helpful to create communities of practice in which corequisite instructors can share struggles and successful strategies.

Selecting Models

When CUNY OAA began supporting colleges' transition to corequisite courses, limited evidence existed on the impacts of different corequisite models on student outcomes. Although the field is still learning how best to design corequisites, there is some evidence from Georgia, Texas, and Colorado that instructor continuity across college-level courses and support sections and a limited number of additional contact hours are associated with higher gateway course pass rates (Bahr et al., 2022; Denley, 2018; Park-Gaghan et al., 2021). Leaders may wish to provide policy guidance based on this existing research. Indeed, an OAA staff member observed that it is much easier to add than subtract contact hours because faculty are often resistant to cutting down course content. Thus, it may be prudent to design new courses with a limited number of additional contact hours.

One of CUNY OAA's goals for allowing flexibility for colleges to design their own corequisite courses was to foster variation in models that met local needs within the system. While there is some variation in models across the study colleges, most colleges used the ALP model for English; although there was no common model adopted in math, the courses had similar characteristics across colleges, including a single course model with only corequisite students and just-in-time integration of foundational topics. Our discussions with college faculty and staff revealed that the models implemented by most colleges are similar to developmental education models already in place on their campuses. Thus, even with time and financial support for curriculum design, colleges may be unlikely to diverge substantially from business-as-usual practices. Policymakers may wish to mandate elements of course design to ensure that colleges implement such features. Shared course designs across colleges may also facilitate professional development, policy design, and evaluation at scale.

The existence of an established, off-the-shelf model such as ALP seems to have been a facilitator for scaling because, as noted above, the majority of sample colleges used ALP, and interviewees described efforts to replicate the well-known model on their campuses. Faculty embraced what they consider to be an established model with a track record of improving student outcomes. Thus, if leaders want colleges or departments to adopt and scale models with specific features, it may be helpful to support convenings or learning sessions to expose faculty and staff to existing models that reflect such features and then modify those models to meet the needs of local contexts. Additionally, once colleges or departments have chosen corequisite models, it is important to invest in aspects of the course models that faculty consider critical for student success, such as enrollment caps and instructor continuity.

Timing

The most significant challenge to the scaling of corequisites in CUNY was timing. The pandemic coincided with the final years of scaling, and many changes to academic support processes happened in the same time period. The concurrence of reforms, policy changes, and other phenomena will make it more difficult to understand the impacts of a shift to corequisites. States, systems, or colleges considering scaling corequisites (or implementing any complicated, costly reform with mixed support) should carefully consider the timing of such a change and take stock of concurrent reforms that could impact student outcomes. CUNY's experience demonstrates, though, that there will always be factors outside of a college's or system's control.

Also, it is important to provide enough time for faculty and staff to make the transition to corequisites. OAA staff, as well as college leadership, noted that the slow pace of the scaling process in CUNY facilitated the transition to scale: It allowed colleges to pilot courses, make modifications, and prepare for the transition. For some CUNY colleges, over a decade passed from initial adoption of corequisites to full scaling. However, a decade may not be a realistic or desirable timeline for colleges and systems currently planning to scale. While the process for the entire CUNY system was long, some colleges that had not adopted corequisites early were able to scale relatively quickly in response to CUNY's mandate. It is also important to keep in mind that when early adopters in CUNY began to implement corequisites, they were relatively uncommon in the field, and models such as ALP were considered experimental. The evolution of knowledge in the field should facilitate and accelerate adoption and scaling processes for colleges and systems who are starting now. Financial support for faculty to develop corequisite curricula and train other faculty to implement the courses may be an important accelerant to the process. OAA staff also noted that allowing colleges autonomy to design corequisites and flexibility in the scaling timeline, although positive in some ways, likely slowed the process overall. States and systems facing a shorter timeline may wish to provide clearer default models for adoption and mandate milestones for scaling.

Using Data and Metrics to Explain Rationale for Change and Evidence of Progress

Developing an evaluation plan that accounts for concurrent reforms and provides data on the impacts of scaling system-wide and within colleges is crucial. It is also valuable to be able to compare and contrast student academic outcomes, student engagement, and faculty experiences with teaching gateway courses before and after scaling. Transitioning to new course structures is complicated and challenging for faculty and student affairs. In the midst of a lengthy transition, stakeholders may forget the challenges involved in previous structures

and idealize the outcomes resulting from them. In CUNY's case, it was common for faculty to point to what they considered to be unacceptably high course failure rates in corequisites to question the efficacy of the reform. However, as we have described in this paper, historic failure rates in prerequisite courses exceeded 60 percent. Thus, it is important to have data ready to remind stakeholders that prerequisite remediation had its own set of challenges. Additionally, using local data to show the effects of corequisites may be important for case-making and formulating policy guidelines. It is therefore recommended to pilot corequisites, evaluate the pilot, and share data with local stakeholders. Further, identifying and sharing metrics that will show benefits of the reforms, particularly the percentage of a freshman cohort earning credit in a subject, can be helpful in conjunction with more traditional measures such as individual course pass rates. Remediation reforms can often positively impact overall academic progress, even as individual course pass rates might decline.

Using data to help college stakeholders grasp the bigger picture may also be important. In CUNY's case, the pandemic accelerated shifts in enrollments between some colleges, with marginal students enrolling in senior colleges rather than community colleges. While rates of freshmen earning math credit improved system-wide, they were lower in most individual colleges because of these enrollment shifts. Without understanding this context, corequisite course faculty may fail to consider how changes in the populations their college served or other environmental factors impacted course success and may instead attribute all the changes to the policy of which they are most aware.

This report has described findings from research exploring the first year of full-scale implementation of corequisite courses in the CUNY system. For many colleges, this transition marked the culmination of over a decade of experimentation with and expansion of corequisites. We examined how CUNY colleges managed the transition to fully scaled corequisite courses and structured their corequisite offerings and the implications of those choices for early implementation. The scaling of corequisite courses represents a complex change process for colleges and systems to manage. As states and systems begin to implement corequisite course models at scale, it is valuable to understand the opportunities and challenges a large system navigated in making the transition, as well as considerations for managing such reforms; these include setting realistic expectations about impacts on student success, determining how to support the adoption and implementation of specific corequisite models, understanding the timing of scaling, and deciding how to use data to communicate reform impacts. This research aims to grow the field's understanding of factors critical to the scaling and implementation of corequisite courses.

Appendix: Supplementary Tables

Appendix Table A1. Key Features of English Corequisites Across Colleges

	Course Name	Credit / Contact Hours	Model Description	Student Population	Delivery Modality	Embedded Tutors[a]
College 1	English 112 College English I	3 credit 5 contact	-ALP -max. 24 students, 12 developmental	PI 64 or lower	In person	X
College 2	ENG 1101CO English Composition I	3 credit 6 contact	-single course -just-in-time support -max. 23 students, all developmental	PI 64 or lower	In person	X
College 3	ENGL 101 English Composition I	3 credit 8 contact	-ALP -25 students, 12–15 developmental	PI 64 or lower	In person Hybrid Online	X
College 4	ENG 10-ENG 110 Accelerated Writing Skills-Expository Writing	3 credit 6 contact	-ALP -just-in-time support -max. 25 students, 10 developmental	PI 49 or lower	In person	X[b]
	ENG 100 Integrated Reading and Composition	3 credit 6 contact	-extended instructional time -just-in-time support -max. 25 students, all developmental	PI 50–64	In person	X[b]
College 5	ENG 12A0 Composition I	3 credit 6 contact	-ALP -max. 24 students, 8 developmental	PI 64 or lower	In person Hybrid Online	
College 6	ENA 101 Composition I Accelerated	3 credit 7 contact	-ALP -max. 22 students, 10 developmental	PI 64 or lower	In person Online	
College 7	ENG 100 English Composition I: Integrated Reading and Writing	3 credit 6 contact	-single course -just-in-time support	PI 49 or lower	In person Hybrid Online	X[c]
	ENG 110 English Composition I: Fundamentals of Writing and Rhetoric	3 credit 6 contact	-single course -just-in-time support	PI 50–64	In person Hybrid Online	X[c]

[a] Embedded tutors are current or former students at the college who did well in English courses and return to the course as a paid peer tutor. Embedded tutors attend all class sessions and provide additional one-on-one support to students during class time and office hours.
[b] At College 4, nearly all English corequisite course sections once had embedded tutors; due to lack of funding and recruitment challenges, now less than a quarter do.
[c] At College 7, due to lack of funding, only a few English corequisite course sections have embedded tutors.

Appendix Table A2. Key Features of Math Corequisites Across Colleges

	Course Name	Credit / Contact Hours	Model Description	Student Population	Delivery Modality	Embedded Tutors[a]
College 1	Math 136C Elementary/Intermediate Algebra/Trig	3 credit 6 contact	-single course -supplemental support -max. 22 students	STEM, healthcare, education	In person	X
	Math 115 Nature of Mathematics	3 credit 6 contact	-single course -supplemental support- max. 22 students	Non-STEM	In person	X
College 2	MAT 1190CO Quantitative Reasoning Corequisite	3 credit 5 contact	-single course -just-in-time support	Liberal arts and non-STEM	In person	X
	MAT 1275CO College Algebra and Trigonometry Corequisite	4 credit 6 contact	-single course -just-in-time support	STEM	In person	X
College 3	MA 114 Col Algebra & Trig for Technic	3 credit 8 contact	-ALP -two courses, one support course	Unknown	In person Hybrid Online	
	MA 119 College Algebra	3 credit 6 contact	-ALP -two courses, one support course	STEM	In person Hybrid Online	
	MA 321 Math In Contemporary Society	3 credit 6 contact	-ALP -two courses, one support course	Liberal arts	In person Hybrid Online	
College 4	MAT 100 SI Introduction to College Mathematics	3 credit 6 contact	-single course -remedial content front-loaded before midterm	Liberal arts and non-STEM	In person	X
	MAT 120 SI Introduction to Probability and Statistics	3 credit 6 contact	-single course -remedial content front-loaded before midterm	Healthcare	In person	X
	MAT 150 SI College Algebra with Trigonometric Functions	4 credit 7.5 contact	-single course -remedial content front-loaded before midterm	STEM	In person	X

(table continues on next page)

Appendix Table A2. Key Features of Math Corequisites Across Colleges (continued)

	Course Name	Credit / Contact Hours	Model Description	Student Population	Delivery Modality	Embedded Tutors[a]
College 5	MAT 500 Introduction to Mathematical Thought	3 credit 7 contact	-single course -just-in-time support	Liberal arts and non-STEM	In person Hybrid Online	
	MAT 2010 Integrated Statistics	3 credit 6 contact	-single course -just-in-time support	Healthcare	In person Hybrid Online	
	MAT 9010 Intro Math w/College Algebra	2 credit 6 contact	-single course -just-in-time support	Non-STEM	In person Hybrid Online	
	MAT 9B0 College Algebra	3 credit 6 contact	-single course -just-in-time support	STEM	In person Hybrid Online	
College 6	MAT 117 Algebra and Trigonometry	3 credit 7 contact	-single course -just-in-time support	STEM	In person Hybrid	
	MAT 119 Statistics with Elementary Algebra	3 credit 7 contact	-single course -just-in-time support	Liberal arts and non-STEM	In person Hybrid	
	MAT 123 Modern Problem Solving	3 credit 6 contact	-single course -just-in-time support	Humanities and fine arts	In person Hybrid	
	MAT 105 Medical Dosage Calculation with Pre-Algebra	4 credit 6 contact	-single course -just-in-time support	Healthcare	In person Hybrid	
College 7	MAT 21.5 Survey of Mathematics I with Algebra	3 credit 5 contact	-single course -just-in-time support	Non-STEM	In person Hybrid	X[b]
	MTH 23.5 Probability and Statistics with Algebra	3 credit 5 contact	-single course -just-in-time support	Liberal arts	In person Hybrid	X[b]
	MTH 28.5 College Algebra and Elementary Trigonometry	3 credit 6 contact	-single course -just-in-time support	STEM and business	In person Hybrid	X[b]

[a] Embedded tutors are current or former students at the college who did well in math courses and return to the course as a paid peer tutor. Embedded tutors attend all class sessions and provide additional one-on-one support to students during class time and office hours.
[b] At College 7, due to lack of funding, only a few math corequisite course sections have embedded tutors.

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